



NBS SPECIAL PUBLICATION 629

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Report of the 66th National Conference on Weights and Measures 1981



NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards¹ was established by an act of Congress on March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, and the Institute for Computer Sciences and Technology.

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¹Headquarters and Laboratories at Gaithersburg, MD, unless otherwise noted; mailing address Washington, DC 20234.

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Report of the

66th National Conference on Weights and Measures 1981

*Sponsored by the National Bureau of Standards
Attended by Officials from the Various
States, Counties, and Cities, and
Representatives from U.S. Government,
Industry, and Consumer Organizations
St. Louis, Mo. , July 13-17, 1981*

Report Editors: Harold F. Wollin
Louis E. Barbrow
Ann P. Heffernan



United States Department of Commerce
Malcolm Baldrige, Secretary

National Bureau of Standards
Ernest Ambler, Director

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ABSTRACT

These are the proceedings of the 66th National Conference on Weights and Measures, sponsored by the National Bureau of Standards, held in St. Louis, Mo., July 13-17, 1981, and attended by State, county, and city weights and measures officials, and representatives of the Federal Government, business, industry, and consumer organizations. Reports by the several standing and annual committees of the Conference comprise the major portion of the publication. Included also are papers presented by Conference officials and other authorities from Government and industry.

Major issues discussed at the National Conference included measurement science education, enforcement uniformity, national type approval, inch-pound and metric labeling provisions, new design and performance requirements for weighing and measuring technology, metric conversion of retail gasoline dispensers, weights and measures program evaluation studies of model State laws and regulations and their adoption by citation or other means by State and local jurisdictions, and a report of States conducting grain moisture meter testing programs.

Key words: Education programs; grain moisture; international recommendations; legal metrology; measurement assurance; metrication; model laws and regulations; packaging and labeling; pattern approval; specifications and tolerances; technology transfer; training; weights and measures.

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Opinions expressed in non-NBS papers are those of the authors, and not necessarily those of the National Bureau of Standards. Non-NBS authors are solely responsible for the content and quality of their submissions.

CONTENTS

(Note: The reports of the standing and annual committees and the treasurer's report, which were presented on Thursday, have been arranged together beginning on page 53 for easier reference.)

Officers of the Conference -----	iv
Standing Committees -----	v
Annual Committees -----	vi
Open Committee Hearings, Monday and Tuesday, July 13-14, 1981 -----	vii

AFTERNOON SESSION - Monday, July 13, 1981

PRIORITIES FOR PROGRESS, Edward H. Stadolnik, Assistant Director of Standards, Commonwealth of Massachusetts -----	1
GATEWAY TO A GREAT DAY, A. D. Tholen, Chief, Office of Weights and Measures, National Bureau of Standards -----	5
THE FUTURE OF STANDARDS POLICY, Calvin J. Collier, Partner, Hughes, Hubbard, and Reed, Chairman, Federal Trade Commission, Member, Reagan Transition Team -----	15
PRESENTATION OF HONOR AWARDS -----	21
PRESENTATION OF PLAQUE TO HAROLD F. WOLLIN -----	23

AFTERNOON SESSION - Tuesday, July 14, 1981

PRESENTATIONS TO THE COMMITTEE ON EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS -----	25
SERVICES AVAILABLE TO NCWM FROM THE ADVERTISING COUNCIL, Richard Hurley, Fairbanks Weighing Division, Colt Industries -----	25
DEVELOPING A NATIONAL TRAINING PROGRAM FOR WEIGHTS AND MEASURES OFFICIALS, Lee J. Phillips, Engineering Extension Service, Texas A & M University -----	29
AN OPPORTUNITY FOR PROFESSIONAL TRAINING, Mary Anthony Weaver, Program Director, Institute for Weights and Measures -----	31

MORNING SESSION - Wednesday, July 15, 1981

ASSOCIATIONS' SPOT REPORTS:

Northeastern Weights and Measures Association, by Sam F. Valtri -----	35
American Petroleum Institute, by Richard Southers -----	37
Industry Committee on Packaging and Labeling, by Alfred E. Johanson -----	39
Task Force on National Type Approval, by Ezio Delfino -----	41
National Scale Men's Association, by Daniel J. Cockrell -----	47
Scale Manufacturers Association, by Raymond J. Lloyd -----	49

AFTERNOON SESSION - Wednesday, July 15, 1981

REPORTS OF STANDING COMMITTEES

List of State Voting Representatives -----	51
1. REPORT OF THE COMMITTEE ON NATIONAL MEASUREMENT POLICY AND COORDINATION, Presented by Edward H. Stadolnik, Committee Chairman -----	53
2. REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS, Presented by John J. Bartfai, Committee Chairman -----	87
3. REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, Presented by Frank C. Nagele, Acting Committee Chairman -----	117
4. REPORT OF THE COMMITTEE ON EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS, Presented by Stan J. Darsey, Committee Chairman -----	187
5. REPORT OF THE COMMITTEE ON LIAISON, Presented by Edward C. Heffron, Committee Chairman -----	195

REPORTS OF THE ANNUAL COMMITTEES

6. REPORT OF THE EXECUTIVE COMMITTEE, Presented by Edward H. Stadolnik, Conference Chairman -----	239
7. REPORT OF THE RESOLUTIONS COMMITTEE, Presented by Edison J. Stephens, Committee Chairman -----	253
8. REPORT OF THE NOMINATIONS COMMITTEE, Presented by Charles H. Vincent, Committee Chairman -----	257
9. REPORT OF THE AUDITING COMMITTEE, Presented by Guy J. Tommasi, Committee Chairman -----	259
10. REPORT OF THE CONFERENCE TREASURER, Presented by Allan M. Nelson, Treasurer -----	261
Conference Registration List -----	263

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(Allen L. Christie, Administrative Assistant, Division of Commercial Inspection and Regulation, State of South Dakota, is reappointed for a 5-year term. Mr. Christie has completed serving out the 2-year term which was vacated by Mr. Malone of Nebraska.)

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(David Smith, Director, Consumer Standards Division, North Carolina Department of Agriculture, is appointed for a 5-year term to replace Charles E. Forester whose term is expiring.)

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Cherylle A. Hughes
Karen L. Sleeth

FAMILY ARRANGEMENTS

Irene Warnlof

STATE LABORATORY METROLOGIST WORKSHOPS

Monday, July 13, 1981

Tuesday, July 14, 1981

and

Wednesday, July 15, 1981

An interesting program was again scheduled this year for metrologists. Topics included laboratory certification by measurement area, reports from regional measurement assurance programs, jewelers scales, and FGIS laboratory operations.

Mr. Richard Suiter, Metrologist, State of Nebraska, served as Chairman of the 1981 NCWM Metrologist Workshops.

TEEX MODEL TRAINING PROGRAM

Tuesday, July 14, 1981

Wednesday, July 15, 1981 (Two Sessions)

The Texas Engineering Extension Service (TEEX) presented a sample "Module of Training." Dr. Lloyd E. Fite conducted the three sessions to provide delegates an opportunity to experience an actual classroom situation.

OPEN COMMITTEE HEARINGS

Monday, July 13, 1981

and

Tuesday, July 14, 1981

Monday and Tuesday were set aside for hearings of the five Conference Standing Committees. Notices of these hearings were carried in the Conference Announcement booklet, in all pre-Conference publicity, and in the printed Conference program. Many delegates participated in the committee hearings and presentations were given by representatives of weights and measures, industry, Government, and consumer groups. The discussions that took place played an important role in guiding the committees in their deliberations and in the preparations of their final reports. The final reports of the committees will follow later in this publication and will reflect the discussions that took place and the actions taken by the Conference at the time the final reports were presented to the delegates.

PRIORITIES FOR PROGRESS

Presented by EDWARD H. STADOLNIK
Assistant Director of Standards
Commonwealth of Massachusetts
Boston, Massachusetts 02108

As Chairman of your 66th National Conference on Weights and Measures, I have the privilege to extend to you a sincere and warm greeting. You will note from the program outline that there has been a selection of topics representing a wide spectrum of priority issues that will provide for continued progress. There has been a departure from the program format that we have had in the past. This has always been a working Conference and the program as outlined is seeking greater participation by all of the members of the Conference. It is through your active participation that your special insights, unique talents, and knowledge are brought to the forefront of this Conference.

To those of us involved in the regulatory process, this Conference has a particularly significant meaning, for when this Conference was first convened in 1905, the then Director of the National Bureau of Standards recognized the need for cooperative effort between the State regulatory bodies and the National Bureau of Standards for attaining uniform, efficient results in the administration of laws and regulations relating to weights and measures. That mission is more important today than it was 76 years ago when we consider the complexity of today's marketplace in terms of equipment design, trade practices, domestic and international implications, the gradual movement towards metric measurement, and a host of wide issues that an ever-expanding technology has brought to the daily life of every citizen of the United States. There was a need for the establishment of this Conference back in 1905--there is a strong need for this Conference in 1981--and there will be a vital need for the continuity of this Conference in the years ahead.

In June of this year, the Congressional House Subcommittee on Science, Research, and Technology, chaired by Representative Doug Walgren of Pennsylvania, conducted hearings concerning the organic act of the National Bureau of Standards. Due to a recent illness, I was not able to attend these hearings. Jim Bird of New Jersey, Sid Andrews of Florida, and Ken Hamner of Fairbanks Weighing Division did a tremendous job in presenting various viewpoints that pointed out the need for maintaining the continuity of the National Conference on Weights and Measures and for strengthening the resources and capabilities of the Office of Weights and Measures at the National Bureau of Standards. I had asked Jim Bird to also represent the National Conference on Weights and Measures at these hearings.

I forwarded a letter to State Directors suggesting that they file written testimony to this Subcommittee and many of you have done so. It is still not too late to let your views be known in this matter. This may very well point out the need for the National Conference on Weights and Measures to engage in developing strong advocacy positions so that we may better carry out our responsibilities to the people of this Nation.

Another priority issue that I continually heard at various meetings I attended during the past year was the need for training and education. This may very well be one of the most significant items we will be facing in the 80's. This week we may see a big step in progress towards meeting the needs for training and education. I am looking forward to attending one of the training sessions to be presented by Texas A & M, and would encourage you all to take advantage of this opportunity. May I also again extend the appreciation of the National Conference on Weights and Measures to Dr. Lee Phillips and the staff at Texas A & M for their cooperation and willingness to undertake this program.

Another priority issue that is being brought to the attention of the Conference deals with the reorganization of the Conference. Every organization must take a good look at itself from time to time to see that it is meeting the demands of its constituency in an effective manner. Keep in mind, that no Conference reorganization will be accomplished without the full support and approval of the National Conference membership according to its bylaws and rules. Several proposals will be considered this week relating to the reorganization of the Executive Committee and the elimination of the National Measurement and Policy Committee. Al Tholen has presented some provocative ideas concerning possibilities of future reorganization. You are asked to look at these issues with an open mind so that progressive steps may be taken to improve the effectiveness of this Conference.

It is certainly most appropriate to extend our thanks to all the members of the Standing Committees, Annual Committees, and members of our various task forces and study groups for that extra effort that they give on our behalf. A new study group was formed this year to evaluate our present weights and measures system and programs and to develop elements of a weights and measures system to meet the needs of the future. This was a recommendation that was approved at the 65th National Conference on Weights and Measures. The mission of this study group will be broad in scope and will require the cooperation of all members of the Conference.

As we review the balance of the items being offered for discussion, debate, and resolution at this Conference, we can indeed see that many of these issues command priority positions in our quest for continued progress. I am sure that we will meet those challenges head-on and will respond in a positive manner to accomplish our goals.

COMMITTEE APPOINTMENTS BY CHAIRMAN STADOLNIK

It is my privilege as your Conference Chairman to announce the appointments to the Standing Committees.

To the outgoing committee members, we again express our thanks and to the new committee members who are taking on these added responsibilities, we express our assurance that this will be an enjoyable and rewarding experience.

The new appointees are:

COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Mr. Fred Gerk, Chief, Standard and Consumer Services, New Mexico Department of Agriculture, is appointed for a 5-year term to replace Gary Delano whose term is expiring.

COMMITTEE ON LAWS AND REGULATIONS

Mr. Don E. Stagg, Director, Weights and Measures Division, Alabama Department of Agriculture, is appointed for a 5-year term to replace Dan Offner whose term is expiring.

COMMITTEE ON EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS

Mr. Allen L. Christie, Administrative Assistant, Division of Commercial Inspection and Regulation, State of South Dakota, is reappointed for a 5-year term. Mr. Christie has completed serving out the 2-year term which was vacated by Mr. Malone of Nebraska.

COMMITTEE ON LIAISON

Mr. David Smith, Director, Consumer Standards Division, North Carolina Department of Agriculture, is appointed for a 5-year term to replace Charles E. Forester whose term is expiring.

GATEWAY TO A GREAT DAY

An Address by A. D. THOLEN, Chief,
Office of Weights and Measures, National Bureau of Standards

The Gateway Arch symbolizes a spirit of energy and adventure which, I believe was and still is characteristic of the American people. This magnificent structure, rising 630 feet above the waterfront commemorates the city of St. Louis as the gateway for thousands of pioneers heading west toward new frontiers. The story of our country and its growth is especially timely at this season of year when we celebrate its birthday. On the 4th of July, my family gathered at the Washington Monument to share that celebration under the spectacular display of fireworks which has become a part of our annual remembrance of our heritage.

As I, along with 500,000 other Americans, watched the fireworks display, my mind began to think of other patriotic symbols--

- o of the shells bursting around Fort McHenry in Baltimore harbor thus inspiring Francis Scott Key to write the Star Spangled Banner,
- o of the flag and its stars representing the individual States, and in more recent times,
- o of the raising of our flag on Iwo Jima, and just a few years ago,
- o of planting our flag on the Moon.

As we grew as a nation, our institutions have grown also. All of these visualizations passing through my mind were converging on the conclusion that times do change, but basic truths do not. In the shadow of the Gateway Arch and in the presence of the flag we respect, I believe that we, gathered here, are also dealing in some basic truths that have served our nation well.

George Washington set the stage in January 1790 in his first annual message to Congress. He said that "uniformity in the currency, weights, and measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to." That declaration has been repeatedly stated by word and action over the years.

The weights and measures system has evolved during the last 200 years as a partnership. This partnership has certain common goals from which responsibilities have developed. The goals are simply stated

- o That Equity May Prevail
- o That Uniformity Will Exist

Weights and measures is an inseparable part of American life

- o It is represented by the State or local official who serves the goal of equity to both buyer and seller
- o It is represented by the manufacturer or businessman who brings us the greatest variety of quality food and goods of any nation in the world
- o It is represented by the Federal employee who works to assure the uniformity that contributes to all other parties.

All of us, serving in our unique roles, all add up to confidence. This is the confidence shared by the American people as they shop in that marketplace every day.

It is no accident that the American shopper has the greatest variety of food and goods to choose from.

It is no accident that the American shopper buys this food and these goods with confidence that the weight or count is honest.

It is no accident that the American driver fills up at the gas station confident in getting the number of gallons or liters registered.

It is no accident that Americans heat their homes in confidence that

- o The fuel oil truck delivered the quantity of oil stated on the ticket, or that
- o The gas pipeline delivered the quantity of gas reported on the monthly gas bill.

I would like to review the evolution of weights and measures with you in order to refresh our understanding of how and why our system works so well (and it does as I have just noted). Let us reflect on our individual responsibilities, at State and local government, at the National Bureau of Standards (and the Office of Weights and Measures), in the food processing and packaging plant, by the device manufacturer, by the service company, and by the retailer.

Since the beginning of time, someone in authority in an organized society has had to take responsibility for assuring accuracy in transactions involving buying and selling goods or services. In ancient times this was the responsibility of the high priest, king, monarch, or other ruler of groups of people. As societies have developed and grown and become more organized, the responsibility for assuring accuracy in commerce has become a function of Government. In most countries this is a Federal function and national law is enforced; but in the United States the enforcement of accuracy in the marketplace rests primarily with State, county, and city weights and measures officials.

FEDERAL ROLE

Let us trace the evolution of the Federal Role. The history of weights and measures enforcement in the United States is roughly parallel to the history of the United States as a nation. In the Articles of Confederation, ratified by the colonies in 1781, there is found the authority for Congress to "fix the standard of weights and measures throughout the United States." This same authority is found in Section 8, Article 1 of the Constitution and became effective in 1789. Also found in the same section is the power to regulate commerce among the States and to regulate coinage. The power to fix the standard of weights and measures is a very broad and unrestricted authority and is known as the weights and measures clause of the Constitution. When Congress acts under this authority, it legislates for the country as a whole without regard to State boundaries. Therefore, the majority of Federal weights and measures laws are interstate rather than intrastate in their application. In order that intrastate commerce be covered with the same provisions, the common expedient has been to cause enactment as State statutes of the appropriate provisions of the Federal acts.

It should be noted that in early colonial times the colonies acted independently in weights and measures matters and were using standards brought with them from the countries from which they had emigrated. Colonial laws were enacted adopting standards, defining units, and providing for the testing of commercial weighing and measuring devices. In the majority of cases, these laws sought to adopt the standards recognized in England. Obviously, under such a system, nonuniformity and chaos in measurement soon developed.

The primary role of the Federal Government is, and has been, one of providing the basis for uniform standards of weight and measure. Why? In order to prevent Chaos!

STATE ROLE

The role of State and local government is also unique among the nations of the world because no overall compliance method for controlling weights and measures is exercised at the national level. Many courts, both State and Federal, have ruled that as long as Congress does not exercise its power in this area, the rights of the individual States are not diminished. Thus, the regulation of weights and measures in commerce and industry has been left largely to the States and their political subdivisions.

About 800 independent or semi-independent jurisdictions exist in this country including State, county, and city programs. The primary goal of the weights and measures officials is the enforcement of the weights and measures laws and regulations. These are criminal statutes and provide authority for fines, jail sentences, and injunctions for offenders. The weights and measures officials are, in effect, special police officers and have the power to arrest violators.

It is the responsibility of the State and local officials to see that equity prevails in all commercial transactions. Both buyer and seller are equally entitled to this protection. Great differences occur in organization, legal requirements, and enforcement procedures; however, in most jurisdictions equity is accomplished through testing, weighing, and measuring devices and through market surveillance.

We even have variations in approach to Weights and Measures administration among the States. Since the States differ considerably as to area, population concentration, terrain, and commercial and industrial interests, there have evolved three different systems of weights and measures administration: (1) the group in which the State law provides for all testing and inspection by State officials, (2) the group in which the State law provides for testing and inspection by both State and local officials under the supervisory control of the State, and (3) the group in which the State law provides that all inspection and testing is to be done by local officials under supervisory control of the State. The majority of the States fall into the second of these categories; namely, of providing for joint State and local inspection.

It is obvious that an extreme amount of variety and disunity exists in the present structure of weights and measures programs in the U.S. Strong guidance and leadership is needed from a neutral organization to prevent nonuniformity and chaos.

NBS ROLE

NBS has no enforcement authority in the weights and measures area and, consequently, plays a unique role in weights and measures administration. The primary goal of the States is enforcement while the primary goal of NBS is to provide technical services to the States necessary to bring about nationwide uniformity in weights and measures enforcement. The Bureau provides this technical service to the States through the Office of Weights and Measures.

Under our system of State and local enforcement of weights and measures laws and regulations it would seem that nonuniformity would be inevitable. Such is not the case largely due to this program of cooperation with the States carried on by the National Bureau of Standards. This Office of Weights and Measures plans and conducts a program of assistance to State and local weights and measures officials and business and industry in the many phases of weights and measures activities.

OFFICE OF WEIGHTS AND MEASURES ACTIVITY

The services of OWM necessary to aid the States in attaining their objective of equity in the marketplace and uniformity across the nation fall into the following categories:

- o Standards
- o Calibrations and Support
- o Technical Systems Development
- o Technical Training, and
- o International Coordination.

STANDARDS, CALIBRATION, AND SUPPORT

As has been stated before, uniform standards are a must. In 1966, Congress provided funds to equip the fifty States, the District of Columbia, Puerto Rico, and the Virgin Islands with new standards of length, mass, and volume in both the U.S. Customary and the metric system and the balances and instruments necessary to support the standards. Fifty State labs have been dedicated plus labs in Puerto Rico, the Virgin Islands, and the District of Columbia.

An ongoing support of the State laboratories is conducted by OWM. Measurement assurance is provided in the State laboratories by monitoring their standards and their capability to perform calibrations appropriate for their needs. OWM also conducts an ongoing program of training State laboratory metrologists.

TECHNICAL SYSTEMS DEVELOPMENT

Examples of this important activity are:

1. The development of technically correct and economically sound specifications of design and performance for inclusion in Handbook 44, "Specifications, Tolerances, and other Technical Requirements for Commercial Weighing and Measuring Devices."
2. The development of field standards and test units.
3. The development of test methods and procedures. Examples of recent areas of concern in which OWM has assisted (not all completed) include liquefied petroleum, gas vapor measuring devices, cryogenics, taximeters and odometers, aerosol products and liquid paint containers, and the accuracy of grain moisture meters.

Most of this work results in technical notes, guidelines, or handbooks used by State and local officials, industry, and business. These publications provide uniformity in specifications, codes, inspection procedures, and performance testing. They also are a major resource for use in training programs at Federal, state, and local levels.

TECHNICAL TRAINING

To supplement the technical services, to fully enhance their value, and to bring about the adoption of model laws and regulations and uniform

interpretations, the conduct of training programs is essential. Historically, training has been a major function of OWM. More recently, training has been regionalized. Many States have developed their own training programs. However, it is essential that training be coordinated in order that it result in uniform procedures, interpretation, and administration. OWM has been exploring the possibility for development of a basic Weights and Measures curriculum and establishment of a national training program. Necessary ingredients of such a program should be:

1. Seminars in weights and measures administration, supervision, and laboratory metrology at the National Bureau of Standards or an appropriate regional location. Industry and other guest lecturers from colleges and universities and other National Bureau of Standards divisions supplement the OWM staff as faculty for such seminars.
2. Training schools in weights and measures supervision, inspection, and laboratory technology for weights and measures and industry officials. These schools are usually held at appropriate regional locations throughout the U.S.
3. On-site field training in special device examinations and in the use of special testing equipment.
4. Educational presentations at conferences of Government and industry officials.
5. Administrative counseling.
6. Development and distribution of publications and training aids.
7. Letters and telephone conversations on specific technical problems.
8. Development and dissemination of a periodic technical newsletter.

The purpose and aim of this training is to increase the individual competence of the weights and measures official and to insure uniformity of enforcement that results from uniform interpretation of laws and regulations and the use of uniform testing equipment and procedures.

THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

The National Conference, sponsored by the National Bureau of Standards, is an essential organization in the United States. The Director of the National Bureau of Standards serves as Conference President and the Executive Secretary is provided by the Office of Weights and Measures.

It is very important that this conference continue to grow in its ability to address the issues facing weights and measures. Recent changes, like the voting system, have been successful. The Executive Committee is proposing organizational changes for consideration this week. I have written a paper (included in the Announcement Booklet) suggesting other possible organizational and procedural changes. I hope you will have opportunities to consider them and provide your views to the Conference leadership.

The primary purpose of the Conference is to develop and promote the use of model laws and regulations and to provide a national forum for discussion and solution of common problems. In sponsoring this Conference, NBS is furthering the goal of Nationwide uniformity in a system that, without strong central technical support and leadership, would be very nonuniform.

I am not going to say anything about International coordination. Resources available to Government officials limit participation. Perhaps this Conference should address the relative importance of this activity.

SUMMARY

The Federal Government has enacted legislation adopting uniform national standards and has provided the mechanism for equipping each State with complete sets of primary weights and measures standards whose values are traceable to the national standards. The uniformity that exists with respect to State laws and regulations is due largely to the efforts of the National Conference on Weights and Measures and the efforts of the NBS Office of Weights and Measures through its technical support program.

Enforcement and testing procedures still differ markedly among the State and local officials. The National Bureau of Standards, through its Office of Weights and Measures, is attempting to provide the necessary technical resources to bring about complete uniformity of enforcement and to cope with changing technology in the marketplace.

The key words in the weights and measures system in this country are cooperation and communication. The system has been cited many times as an outstanding example of Federal/State cooperation in an area that is vital to the public welfare.

We, you and I, have a unique and necessary partnership.

Day-by-day provision of equity is in the hands of you who are State and local government weights and measures officials.

The support of your programs in the provision of the basis for uniformity is my responsibility as an agent for NBS and the Federal Government.

Recently, the House Subcommittee on Science, Research, and Technology held hearings on the Organic Act of the National Bureau of Standards.

The Chairman of the Subcommittee said that the review "will examine how well the Bureau's present charter, originally enacted in 1901, serves present needs," and "will seek to determine how the Bureau can and should serve these and other Federal and national needs for research and development by Government, industry, and the universities in future years."

Three of your leaders (Sid Andrews, Jim Bird, and Ken Hammer) testified before the House Subcommittee expressing their views of the needs of the weights and measures system for support by the Bureau and the Office of Weights and Measures.

As a follow-up to the hearings, Dr. Ambler called a meeting to consider suggestions for responding to the needs expressed at the hearings. At that meeting (which I attended), we had an opportunity to exchange views regarding the testimony and to discuss the needs of the States for support by the National Bureau of Standards.

It is clear that the State and local governments and related industry have many needs. The testimony is further supported by the measurement needs study currently in progress by the Bureau.

The Bureau wants to work with you through the National Conference on Weights and Measures in order to identify the specifics of the States' needs and be better able to respond.

So, the Federal role is being examined. At the same time, you in State government are finding your programs under study as a result of budget considerations. We are all aware of Proposition 13 in California and Proposition 2-1/2 in Massachusetts.

I believe that our roles, built on two centuries of success, will be recognized as essential for the preservation of equity and uniformity; for the preservation of marketplace integrity; for the preservation of the confidence our fellow Americans have in that marketplace.

We each have special roles, and special duties. They have evolved to satisfy needs of the marketplace. That evolution has worked well; it has been successful. Our relationships have been so well developed that we interact automatically, naturally.

The result has been the healthiest, most lavish marketplace on Earth. Out of a diversity of State centered commercial activity and regulation, we have built a truly working system based on roles you and I take for granted.

I believe the examination of our relationships is healthy and will result in a reconfirmation of our roles, and a strengthening of our system. What we are doing, and how we relate will be seen as a natural result of evolution paralleling the development of our nation.

The Gateway Arch, which symbolizes the passing through of our pioneers westward, can be a special symbol for us today. Let it symbolize the gateway to our future; of our special relationships; of our moving ahead stronger because of some adversity, with energy and vision to make the marketplace even more equitable and uniform.

This can truly be the "Gateway to a Great Day" for all of us, State and local Weights and Measures Officials, manufacturers, packagers, businessmen, and Federal employees. But, more importantly, it can be the "Gateway to a Great Day" for the American shopper.

THE FUTURE OF STANDARDS POLICY

Presented by CALVIN J. COLLIER, Partner,
Hughes, Hubbard and Reed
Former Chairman, Federal Trade Commission
Member, Reagan Transition Team

It is an extraordinary privilege to address this conference. It would have been a privilege when I served in positions at the U.S. Commerce Department--and had some responsibility for the policies I will discuss this afternoon. Or when I was at the Office of Management and Budget and helped develop the budgetary priorities that you had to live with. And it would have been a privilege when I chaired the Federal Trade Commission which only tries to protect consumers from fraud and deception while you actually do the job. So it is a special honor to appear as a private citizen to discuss emerging policies in the Federal Government for industrial standards.

Just over six months ago I took some time away from my law practice to work on the transition for President-Elect Reagan. My primary responsibility in that effort was the U.S. Commerce Department. And one of the important areas that drew our attention was the policies and programs of the Department with respect to standards.

I would like to begin by sharing with you what we found and some of the concerns that I had with our findings. First, we found a proposed set of regulations aimed at the country's private voluntary standards system. These regulations would have imposed various mandatory requirements on organizations that develop standards and would have greatly expanded the Department's role in actually writing standards for American industry. Second, we found a troublesome arrangement of priorities and activities in the Department's Science and Technology Programs, including the National Bureau of Standards. Finally, we found the ingredients of an enlightened approach towards the subject of international standards. But here too, there were some problems that seemed to warrant corrective action.

Missing from all of this--in my view--was an agreeable and coherent policy towards standards. Or perhaps there was a policy and I simply thought that it needed to be overhauled. It is helpful, I think, in piecing together a new policy to take a closer look at the government's agenda of last fall.

STANDARDS REGULATION

The Department's proposed regulations to govern organizations that develop standards purported to implement a 1980 White House policy in the form of an OMB "circular" or directive to all Government agencies. This circular, in essence, encourages Government agencies to rely on privately developed standards in establishing procurement specifications and to participate actively in the private standards-making process.

In these respects the 1980 circular is generally unobjectionable but hardly novel. Government personnel have traditionally contributed to the standards process by participating on standards-writing committees or commenting during the consensus process. Moreover, Government reliance on private standards--both for procurement and for regulation--is commonplace. After all, private voluntary standards are an essential part of our commercial vocabulary. By defining product characteristics and by specifying methods to measure those characteristics accurately and efficiently:

- ° Buyers benefit because they know exactly what they are paying for and because standards allow a large number of potential suppliers to compete for their business.
- ° Sellers benefit from standards because they can anticipate buyer requirements and satisfy them.

Good private standards achieve these benefits by incorporating a wide range of considerations in the development process, including current technology, production feasibility, purchaser requirements, and the economics of the particular market. Because of the benefits to both sides, buyers and sellers alike have an incentive to pool their resources to develop standards. These incentives have attracted substantial private resources devoted to standards writing and most of the technical and judgmental capacity to write good standards in this country--unlike most others--resides in the private sector. So it is easy to see the wisdom of relying on this marvelous system as a source of standards needed by the Government.

Although reliance is good policy, it cannot afford to be uncritical. Not all private standards are good ones and some may become obsolete. In the private sector, these problems are largely self-correcting. Buyers are free to ignore bad or obsolete standards and sellers are free to convince their customers to abandon a standard in favor of a better mousetrap.

Unfortunately, when Government relies on private standards it frequently ignores the importance of flexibility. In procurements, standards can become a security blanket for officials who balk at the prospect of being criticized for departing from existing specifications. In most regulatory contexts, the self-correcting mechanism of voluntariness is completely destroyed as departures from standards become law violations. Nevertheless, a policy of reliance on private standards--if flexible and careful--is clearly a wise one. However, the 1980 OMB circular and Commerce Department regulations did not stop with reliance. Instead, they went on to impose procedural requirements in the name of "due process" on standards-making organizations as a price for reliance on organizations. Not to be outdone, the FTC proposed even more onerous regulations for these organizations--though the only carrot offered by the FTC to those who chose to comply with its proposals was freedom from fines and penalties.

Time will not permit me to go into the details of these regulations, but I would like to take a few moments to explore their apparent premises. Four stand out. First is the apparent assumption that private standards frequently restrain competition rather than enhancing it. Second is the assumption that cumbersome procedures can eliminate anticompetitive conduct. The third premise is that Government must act to write standards that industry has decided not to develop on its own. Finally, these regulations assume that standards organizations would function better if they recruited so-called public interest representatives. In my view, all of these premises are flawed.

Some concern with the potential for anti-competitive abuse of standards is warranted but paranoia on the subject is not--for several reasons. While it is true that producers who want to fix prices cannot enjoy the fruits of their monopoly unless they also agree to fix quality levels (otherwise they would compete away their monopoly profits by trying to improve product quality to attract larger sales volumes), this concern is easily overblown.

- ° First, it ignores the fact that buyers as well as sellers routinely participate in writing standards.
- ° Second, it ignores the strong temptation by producers to cheat on price-fixing cartels by competing through better quality or service offerings.
- ° Third, it ignores the fact that this sort of abuse may be a crime under the antitrust laws. Price fixing usually occurs in the proverbial motel room out of public view; by contrast, standards are highly visible and would be easy game for prosecutors. No wonder, then, that there are so few recorded instances of anti-competitive misuse of voluntary standards.

Likewise, the assumption that mandated due process requirements will prevent abuse is not well taken. Some of the specific examples of alleged standards abuse in recent years have come from organizations with elaborate due process requirements, and far less elaborate procedures than those which are mandated by the proposed regulations are plenty adequate to avoid clandestine abuse.

Nor is there any apparent basis for the premise that government must rush in to develop standards that industry has declined to adopt. The usual explanation for industry inaction is simple lack of interest--it is a waste of time and effort to write standards for which there is no demonstrable public demand.

Finally, I see no merit in forcing standards organizations to recruit self-appointed public interest representatives--aside from the obvious political appeal to those who populate these groups.

As you can surely tell by now, I was not overwhelmed by the wisdom of these regulatory proposals or the policies that they embodied. So I have been quite pleased with the actions to date of the New Administration. Shortly after the inauguration the Commerce Department's regulations--which had been promulgated as a last minute act of the outgoing administration--were temporarily suspended. Upon further review they were suspended indefinitely. Although the Administration has unraveled one mistake, it is not out of the woods. The FTC proposal is still awaiting final action and the OMB circular is still on the books.

COMMERCE DEPARTMENT PRIORITIES

So much for now for regulatory proposals and the issues that they pose for standards policy. The second discovery of the transition team was an array of priorities and arrangements at the Commerce Department that we believed were misdirected. In particular, we were troubled by the Department's Science and Technology activities. One of these activities--standards regulation--has already been discussed. This activity was centered in the Office of the Assistant Secretary and we recommended that the unit in that office that was responsible be offered up for budgetary savings.

The second feature of the Assistant Secretary's office to draw our attention was the organizational arrangement whereby the Patent and Trademark Office and the National Bureau of Standards reported to the Assistant Secretary. We saw no good reasons for this added layer of bureaucracy and proposed that both of these important organizations be given direct reporting lines to the Secretary. In the case of the Patent Office, our recommendation was based on the general lack of any good purpose being served by the Assistant Secretary's jurisdiction. In the case of the Bureau of Standards, however, our concerns went deeper.

Over the past ten years and especially over the past four, the Science and Technology Office of the Department had drifted from its important service functions toward an activist agenda of intervention in the private economy. Dramatically typifying this trend were plans to establish a new unit in the Office to identify opportunities for commercial growth by the development of applied technology. For example, if the office felt that American industry had ignored a profit-making opportunity to develop new or better products, then the Department would aid and assist in that development. We had two serious objections to this trend. First, it was incompatible with our view of the proper role of Government. We didn't go in much for subsidies to business or Government entrepreneurialism. Second, this trend distorted the priorities of NBS.

In our view, the Bureau served the public best when it provided basic measurement services. This was its original reason for being and remains its strongest justification for existence. Unfortunately, a succession of Assistant Secretaries had diverted NBS from this course and into a succession of less important and politically glamorous

detours. Our transition solution was straight-forward: take the Assistant Secretary out of the loop. For I was convinced that the problem of misplaced priorities could not be solved as long as Assistant Secretaries were coming and going with a desire to make their mark by forcing the Bureau to divert its attention to the latest fad in the name of "relevance." Much like public education, it seemed to me that NBS should get back to basics.

What has happened to these recommendations for new priorities and arrangements? I think that some are in the process of being implemented and I hope that the others will emerge in due course. Various reorganization proposals are in the works or have been adopted that will simplify and streamline the Science and Technology area. Some of the applied technology initiatives have fallen to the budget ax and new thrusts in that direction seem unlikely. No movement is yet clear, however, in changing the priorities of NBS.

INTERNATIONAL STANDARDS

Our final discovery in the transition was more pleasant than the first two. We discovered that the previous administration had made significant progress toward establishing a framework for addressing the problems of standards in the context of international trade. As part of the multilateral trade negotiations, there was negotiated an agreement on standards that calls upon countries to refrain from using standards as trade barriers. For example, signatories are expected to avoid the adoption of standards that discriminate against foreign producers and to engage in consultations to prevent discrimination. The Department had assigned the responsibility for implementing the new arrangements to the Office of Product Standards. We felt that implementation would be more effective if handled by the International Trade Administration of the Department.

The same way be true with respect to responsibility for developing international standards. Here, the primary responsibility must rest in the private sector. Government must be involved in those cases--virtually all--where there are Governments on the other side of the table. We can't expect U.S. businesses or standards organizations to carry the entire burden of effective participation in these forums. Fundamentally, however, I see the Government's role as a fairly passive one. The lead must come from the private side and Government must be prepared and equipped to assist these efforts in much the same way that it supports other overseas commercial ventures. It must, in short, provide effective access to these activities and back up its commercial constituents.

TOWARD A NEW STANDARDS POLICY

Having canvassed the major issues of standards policy facing the New Administration and having identified some of its early actions to change previous policies, I would like to conclude with a general proposal for a new standards policy for the 1980's. Here goes!

First, the Commerce and FTC proposals for regulating the private voluntary standards process should be terminated. These proposals are unnecessary, would not produce any benefits, and would destroy the proper balance between the private sector and the Government.

Second, and in due course, the Administration should revisit the OMB circular with an eye toward eliminating its regulatory requirements.

Third, the Government should rely on antitrust to regulate standards abuses. Those laws are entirely adequate to deal with potential problems and their existence deters most temptations to misconduct.

Fourth, Government should be more critical in relying on private standards to avoid inefficiently rigid requirements. Caution is especially necessary in using voluntary standards for mandatory regulations.

Fifth, Government should recognize and reaffirm the values of the private voluntary system to promote economic and technological progress. And concurrently, it should reaffirm the Government's support and encouragement of private initiative without needless meddling.

Sixth, the National Bureau of Standards should restore its basic mission and withdraw from those activities that put it into competition with profit-making businesses. The Bureau's basic measurement support activities have suffered too long from inattention. It is especially unfortunate when these functions are starved even though the beneficiaries are willing to support them on a reimburseable basis.

Finally, the Commerce Department should continue to address the neglected problems of international standards. It is not enough to remove trade barriers. Affirmative measures are needed to support U.S. standards-making organizations with the goal of increased harmonization of technical requirements, testing methods, and certification systems.

These actions would, in my view, mark an excellent new beginning for the 1980's by restoring a proper and productive balance between the nation's private voluntary standards system and its Government.

Thank you.

PRESENTATION OF HONOR AWARDS

A. D. Tholen, presented Honor Awards to members of the Conference who, by attending the 65th Conference in 1980, reached one of the attendance categories for which recognition is made--attendance at 10, 15, 20, 25, or 30 meetings.

Award Recipients

30 years

George L. Johnson Retired, State of Kentucky

25 years

Robert J. Silcock Vigo County, Indiana

20 years

John H. Lewis Retired, State of Washington
James F. Lyles State of Virginia

15 years

Lacy H. DeGrange State of Maryland
Eugene Keeley State of Delaware
Robert E. Nix Zackrisson Associates
H. Steffen Peiser Retired, National Bureau of Standards
Thomas M. Stabler Toledo Scale Company
Richard L. Thompson State of Maryland
Robert W. Walker State of Indiana
Harry K. Johnson FGIS, U.S. Department of Agriculture

10 years

Benjamin F. Banks FGIS, U.S. Department of Agriculture
Lawrence J. Chisholm U.S. Metric Board
Charles J. Denny William M. Wilson Sons, Inc.
Thomas E. Kirby State of Georgia
Kenneth F. Hammer Fairbanks Weighing Division
Wallace H. Seward Basic Resource Services, Inc.
Joseph Silvestro Gloucester County, New Jersey

Certificates of Appreciation

Gary Delano State of Montana, S & T Committee
Charles Forester State of Texas, Liaison Committee
Daniel Offner City of St. Louis, L & R Committee
Edward H. Stadolnik Conference Chairman, State of
 Massachusetts

PRESENTATION OF PLAQUE TO HAROLD F. WOLLIN



Chairman Edward H. Stadolnik presents Harold F. Wollin with a plaque bearing a Certificate of Achievement in recognition of his 27 years of dedicated service to the National Conference on Weights and Measures.

PRESENTATIONS TO THE COMMITTEE ON
EDUCATION, ADMINISTRATION, AND CONSUMER AFFAIRS

Services Available to NCWM from the
Advertising Council

Presented by RICHARD HURLEY,
Fairbanks Weighing Division, Colt Industries

It is a pleasure to appear before you this afternoon to discuss a proposal on your agenda to offer the National Conference on Weights and Measures a means to make highly visible the work of the members of this organization to the consumers of the United States. It has been recognized by members of the National Conference and by others who have known the members of the weights and measures community that the very important function performed daily by the weights and measures officials is virtually unknown, unrealized, and unrecognized by the American consumer. As a consequence, this week the Conference has an opportunity to vote on a motion which may have a significant effect upon this phenomenon, and make a profound change in the level of recognition of weights and measures activity. But more importantly, it is an opportunity to make the function of weights and measures highly appreciated by everyone in the United States.

What is the proposal? Let us take a look. Here is the watchdog of commerce--the weights and measures official. He is concerned about the proper operating performance of gasoline pumps, weighing devices, meters, and many areas in commerce where material is either weighed or measured. He works to make certain that full measure is given to the purchaser, and that the seller receives full value for his services or goods. The arbiter of equity, that is the weights and measures official. The person whose job it is to make certain that equity prevails in the true sense of the word; that the buyer and seller each gets a fair deal with the measuring or weighing device. Who is it? It is you--the weights and measures official--you are the watchdog; you are the arbiter. You are also the unsung hero of the United States.

There are many reasons for this position. One reason is the consumer. The consumer assumes and expects. The consumer assumes that when he or she buys a pound of hamburger it is indeed 16 ounces, and he or she is willing to pay for it with that assumption. Consumers expect a gallon of gas to flow through the meter and into their cars every time they pay for a gallon of gas. The yard of goods is expected to be a full 36 inches. Packages are assumed and expected to contain the quantity so indicated on the outside. Consumers hold to their assumptions and expectations, but they do not know why. You do.

The majority of weights and measures budgets are controlled by legislatures of one form or another--city, country, State. The members of those deliberative bodies, when it comes to the understanding and appreciation of most weights and measures activities, are skeptical, and they are sometimes downright miserly. The skeptic who is the legislator wonders whether the money spent to control weights and measures in that jurisdiction is appropriately spent and, as a consequence, very

often is only too ready to cut budgets without understanding the true value of the weights and measures activity. He forgets that assurance of equity pertains to him and his household, as a consumer.

On another front, the device owner is ambivalent in his feeling toward weights and measures people. If you walk into a device owner's establishment and red tag the device, he is immediately upset regardless of the fact that it was his own poor maintenance practices that caused the device to go out of tolerance. On the other hand, if you put a new seal on an accurate device, he expects that to happen so he can stay in business. So on the one hand he can be upset about the weights and measures official; on the other hand, he simply accepts the seal as his due. The official goes away and is forgotten. All these conditions contribute to the obscurity of W&M people mostly because of lack of information and lack of understanding on the part of the average citizen. The weights and measures official is the unsung hero of commerce.

Now there is a panacea in sight. There is light at the end of the tunnel as it were, and the light can be shed upon each of you individually. What does that mean? How would you like to be a hero in your own hometown? Literally. You, the weights and measures official, portrayed in your real function, as the watchdog of commerce, as the arbiter of equity; on television, on the radio, in magazines, in newspapers, on outdoor billboards. You would be a celebrity year-round with a continual campaign, daily, weekly, monthly; commercials and advertisements talking about you and your activities and your importance to the public and to commerce; loud and clear, border to border, coast to coast. It would happen in New England, in metro areas, in the farm belt, in the grain belt, mid-America, the southwest, the far west. Everywhere in addition to your own jurisdiction you would be as well-known to the American public as is Smokey The Bear, or the Red Cross campaign, 55 miles per hour, or crime prevention canine.

How can we do it? I will tell you how. There is an organization, called the Advertising Council, which creates and promotes public service advertising locally and nationwide. The Advertising Council is a large organization of executives from major manufacturing and service industries in the United States, and the major advertising agencies with whom they work. General Motors, Procter & Gamble, AT&T, General Foods, and many more. When a service or an idea is accepted for public service advertising by the Advertising Council, the organization supplying the service actually becomes the client of the Advertising Council. Marketing and creative executives from companies represented on the Council and from the advertising agencies are selected to form an account handling group and a marketing group. They take a close look at the requirements and needs of the new client and actually market that idea to the U.S. public just like a new product. That is how Smokey The Bear was created. That is how the Red Cross campaign was built. That is how the crime prevention campaign came into being. When the Advertising Council accepts the application of a proposed client there is no media cost for the millions of dollars of advertising support provided. Television, radio, magazines, newspapers, outdoor

signs, the whole spectrum of media available is donated by the various media outlets.

The National Conference appears to meet the strict criteria of the Advertising Council, based on the draft application which has been prepared. If accepted, NCWM would be supported by millions of dollars of time and space donated free of charge by the media. The first year production costs are borne by the client. In this case, acting for the National Conference the Office of Weights and Measures would provide the first year of production costs. Production costs cover newspaper mats, magazine layouts, television commercial films, and radio commercial tapes.

The Committee on Education and Consumer Affairs supports the recommendation. The Committee asks for your individual vote on Thursday. Your "yes" vote will approve forwarding the application of the National Conference to the Advertising Council immediately after the close of the 66th Conference. The end result--consumers, legislators, and device owners will recognize and appreciate your daily efforts in your jurisdiction: you, the watchdog of commerce, the arbiter of equity; you, the weights and measures official. Your support is sought this week. We believe the NCWM application to the Advertising Council can lead the way to a real breakthrough in public recognition of each weights and measures official in the United States.

DEVELOPING A NATIONAL TRAINING PROGRAM FOR WEIGHTS
AND MEASURES OFFICIALS

Presented by LEE J. PHILLIPS,
Engineering Extension Service, Texas A & M University

Since January, 1980, the Texas Engineering Extension Service, Texas A & M University System, in cooperation with the Office of Weights and Measures, National Bureau of Standards has investigated the feasibility of developing a training program for weights and measures officials that could be taken to the many jurisdictions of the country.

In January, 1981, a three-day conference on "Technical Training for Measurement Practitioners" was held at Texas A & M in conjunction with the NCWM interim meeting. The result of that meeting of regulatory officials, measurement laboratory personnel, plus representatives of the weighing, measuring, and food processing and packaging industries made it possible to identify specific training requirements.

In February, 1981, Dr. Lloyd Fite and I met with field inspectors from Texas and Louisiana and further refined the level of training and the format most desired by these individuals for whom the training is to be designed. Special recognition and appreciation are extended to Mr. Charles Forester and Mr. Philip Staggs and their inspectors for the time, trouble, and effort expended in helping us better understand exactly what is needed. Their comments and suggestions were candid and constructive. From these visits, we were able to develop not only a need statement but also the modular package Dr. Fite will present this afternoon and twice tomorrow afternoon. We sincerely hope you will attend one of these presentations to get the "feel" of our approach to training. The information is not necessarily designed for you--it is designed for job-entry field inspectors. It is not a complete package, it is a module from a series of planned sessions on electronic scales.

The need statement I mentioned earlier was a document requested by our Congressman Phil Gramm who has determined that there is a valid, vital need for the program we are proposing to the Office of Weights and Measures. In cooperation with the OWM, a discussion paper was prepared outlining the need, an implementation plan, and a five-year budget that would support the development and implementation of this national training effort. Our promise to the Congressman is "if you will support the initial effort we will design operation to be self-supporting in five years." This implies that the jurisdictions will be asked to get into their budgetary process some training funds that would be needed five years after program initiation.

As a result of the efforts of your Committee, the participants at the January Conference, the sample of field inspectors, and with the support and guidance of the Office of Weights and Measures, "the ball is in the air." Legislation to fund the first two years of the training has been prepared and will be introduced. We, of the Texas Engineering Extension Service, are excited about the concept and are sincerely enjoying the experience of learning about the vital part your personnel play in the economic and medical health of our nation.



AN OPPORTUNITY FOR PROFESSIONAL TRAINING

Presented by MARY ANTHONY WEAVER, Program Director,
Institute for Weights and Measures

The Institute for Weights and Measures, IWM is underway, conducting courses and special training for service technicians, businessmen, and officials.

IWM, a nonprofit educational corporation, is governed by a board of 26 trustees from State, Federal, and local government, from industry and education. At the first annual meeting held in Columbus, Ohio in January 1981 the Trustees, Officers, and Executive Committee were elected and educational programs for 1981 were discussed.

IWM is providing educational opportunities for the professional weights and measures community--weights and measures officials, industry technicians, users of commercial weighing and measuring equipment, and consumers. It is IWM's objective to offer training to every sector of the weights and measures community so that technicians, businessmen, and officials may become more knowledgeable and more aware of the changes in our technology, in laws and regulations, and in inspection and test procedures.

Educational programs are offered by the Institute in Weights and Measures Technology, Weights and Measures Administration, and Weights and Measures Business Administration in three levels of instruction (basic, intermediate, and advanced).

Training programs may be presented as correspondence courses at home, as hands-on technical workshops at local colleges, as seminars at State Universities or as specialized training conferences in a nearby city.

Each training unit is designed specifically for the persons participating. Programs may be one day, five days, or of two weeks duration. An Instructor's Guide for each course includes a lesson plan, handouts, discussion questions, class activities, assignments, bibliography, and evaluation. Class notebooks are prepared for each student. Adult education credits and certificates are awarded for completion of the training unit.

A highly qualified faculty is selected by the Institute, coming from industry, government, and educational fields.

In addition to the training program, the Institute publishes a bi-monthly newsletter announcing current and future training opportunities, and containing news articles about people, places, and events of the weights and measures community.

Publications are offered for use in the educational program as well as for sale to private individuals. These publications discuss

equipment technology, weights and measures laws and regulations, inspection and test procedures, and aspects of business administration, and contain weights and measures directories and other resources.

Assistance is also offered to officials and industry planning their own training program. This may include compiling training resources, making facility arrangements, and finding qualified speakers.

The IWM Charter Membership year (1981) began in January with membership open to all persons regardless of age, race, creed, or affiliation. Membership, which is the principal source of financial support for the Institute, is structured to suit every need with five plans available for individuals, agencies, companies, and associations.

In February 1981, the IWM Program Director was employed and training programs were initiated.

To date, eight IWM publications have been printed and over 1100 copies distributed...

More than 100 Charter Memberships have been taken in 33 States and 3 foreign countries...

Three IWM Newsletters have been issued...

An IWM exhibit was displayed at the National Scale Men's Association Conference in Toronto, Canada in May 1981...

On July 1, 1981, the Institute for Weights and Measures moved into its permanent headquarters at Franklin University in downtown Columbus, Ohio. Franklin University has been a significant force in business and industry since 1902. Presently, with an enrollment of 5,000 students, the University has many unique features that support the program of adult education conducted and coordinated by the Institute. The University is a leader in electronics thru the College of Science and Engineering Technology, and has excellent facilities for continuing education. A modern comfortable auditorium, class rooms, and library will provide an appropriate environment for IWM seminars. The downtown location will afford ready access to public transportation and lodging for overnight guests...

A second employee, and Administrative Assistant, has been added to the IWM staff...

The most significant of all--since February, eight IWM educational programs have been conducted and 12 more are scheduled between August and December.

February	Scales on Saturday, Lancaster, PA
April 3	IWM Basic Course, Kent State University, Canton, Ohio
April 7	NMS Regional Training, Kansas City, KS

April 20-May 1	IWM Fundamentals of Electronics, Kansas City, MO
April 25	Scales on Saturday, Marietta, OH
May 5	NBS Regional Training, Rapid City, SD
May 27	NBS Regional Training, Orlando, FL
June 25	IWM Basic Course, Marietta College, Marietta, OH
August 5	New York State Training School, Morrisville State University, Morrisville, NY

The Institute for Weights and Measures needs the support of individuals, companies, and government agencies in order to provide the educational programs needed by the weights and measures community.

Be sure to contact us if we can assist you in providing an opportunity for professional training.

ASSOCIATION'S SPOT REPORTS

NORTHEASTERN WEIGHTS AND MEASURES ASSOCIATION

Presented by SAM F. VALTRI, Association President
and Chief, Bureau of Weights and Measures,
Philadelphia, Pennsylvania

The 9th Annual Conference of the Northeastern Weights and Measures Association is now history, and it was a great success. The Conference was held at the Holiday Inn, Hyannis, Massachusetts and was hosted by the Massachusetts Division of Standards and the Massachusetts Weights and Measures Association. The Conference Chairman was Tom Geiler, Sealer of Weights and Measures, Town of Barnstable, Massachusetts. The type approval task force technical working group met concurrently with the Northeastern Conference at Hyannis.

The Conference program was well presented and the speakers were excellent. The success of the Conference was assured by the following jurisdictions being represented: Connecticut, Illinois, Indiana, New Jersey, New York, Ohio, Massachusetts, Pennsylvania, and Vermont, along with delegates from counties, municipalities, and industry.

Highlights of this Conference were the address by Al Tholen, Chief, Office of Weights and Measures, National Bureau of Standards on the "New Role for Regional Conferences," and the panel discussion on net weight issues. This panel was composed of John Bartfai, New York; Darrell Guensler, California; Sam Valtri, Philadelphia; Carl Taubert, Pillsbury; and Ed Wolski (retired) Colgate-Palmolive. Many questions were posed which generated a lively discussion among the members present.

During the past year, jurisdictions in the Northeastern Weights and Measures Association received visits from overseas weights and measures officials, and members participated in training programs conducted by OWM. NEWMA News is published quarterly and seems to reach all of the weights and measures jurisdictions in the NEWMA area of responsibility as well as the four regions throughout the United States and our associate membership. Coordination was established in the Pennsylvania area with the formation of the Greater Delaware Valley Chapter of NSMA. Many of the members of this Chapter are also members of the Northeastern Weights and Measures Association. The Philadelphia Bureau of Weights and Measures is now utilizing heavy duty equipment which is of the finest in the Northeastern area of the United States.

All of our fellow members in weights and measures, as well as our friends in industry, are cordially invited to attend the 10th Annual Conference of the Northeastern Weights and Measures Association to be held at the Hotel Hershey, Hershey, Pennsylvania from March 28 to April 2, 1982. You are also cordially invited to our interim meeting which will be held in Philadelphia during the month of November.

The 10th Annual Conference will be hosted by the Pennsylvania Association of Weights and Measures, and we look forward to your participation in our Conference.

We extend to Harold Wollin our best wishes on his approaching retirement and thank him for his dedicated service to the National Conference on Weights and Measures as the Executive Secretary.

AMERICAN PETROLEUM INSTITUTE

Presented by RICHARD SOUTHERS, Manager
Operations and Engineering, API

The American Petroleum Institute welcomes this opportunity to let you know about some of our activities. I am very pleased to announce that we have just recently signed a contract with Radian Corporation to conduct a study on the effects of mandatory temperature adjustment regulation on the marketing segment of the petroleum industry. These regulations as currently being proposed sometimes require and sometimes ban the practice of temperature adjustment of measured volumes. The purpose of the study, which it is projected will require nine months time, is to provide assistance to companies and regulators in the consideration of the effects of proposals related to temperature adjustment.

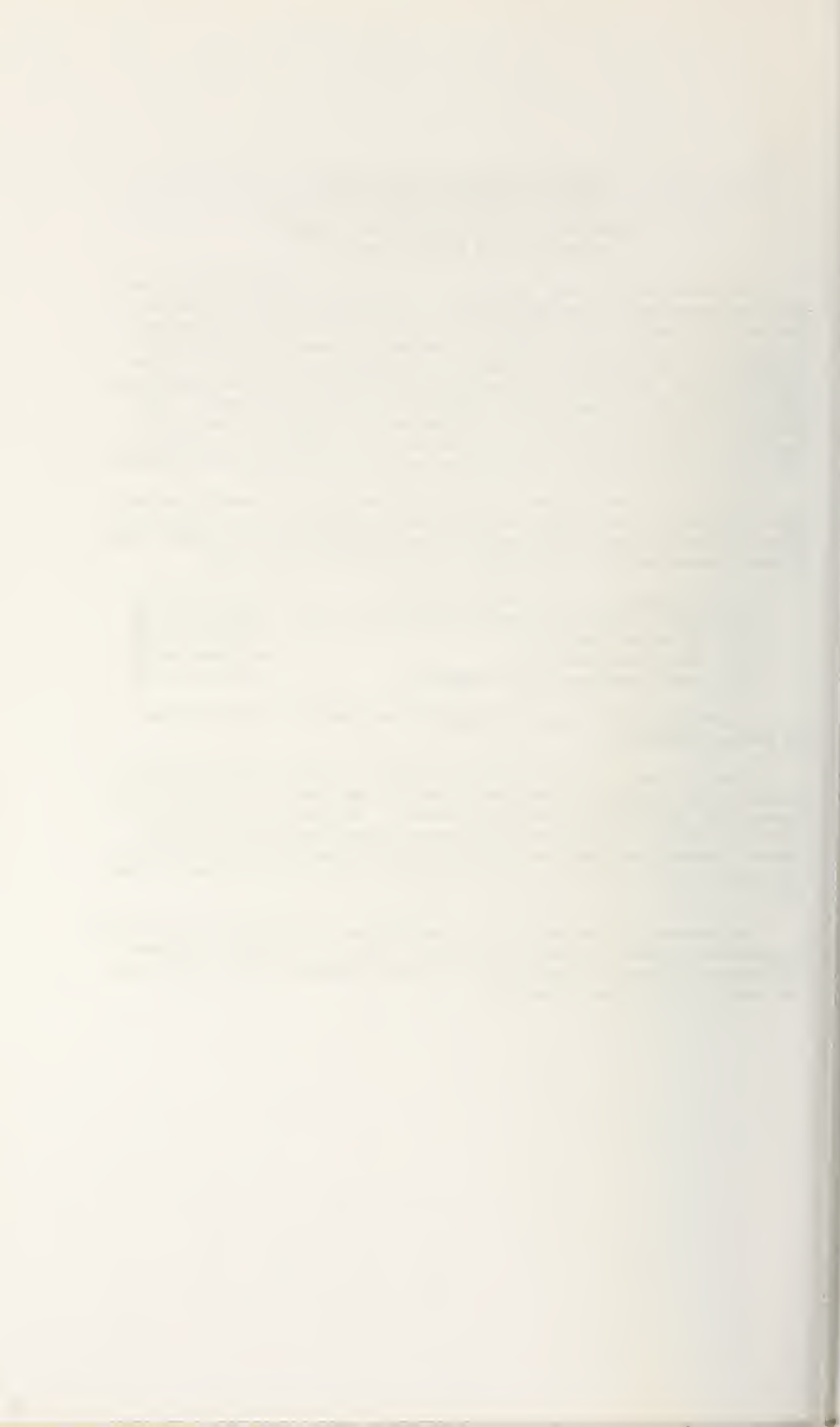
Another item of interest to this conference is the results of the May 1st survey of the status of conversion of service station computers. In this survey 16 major oil companies and 2 independents responded. The survey covered 483,536 computers. The results are as follows:

(a) Converted to over-a-dollar pricing	331,792--68.6%
(b) Metric capability installed but not in use	296,574--61.3%
(c) In metric usage	89,661--18.5%
(d) Total units modified	427,964--88.5%
(e) Total remaining to be converted	55,572--11.5%

Incidentally, last year we informed you that the conversion was 39 percent complete.

Lastly, most of you are aware that API, in cooperation with ASTM, published new temperature correction tables last Fall. In their present format they are rather large and expensive. The committee responsible for these tables is aware of need for an abbreviated version of the tables covering the products and temperatures generally found in marketing operations. We will keep you informed on this as developments take place.

Because he was responsible for instituting this item in the National Conference Program, we would certainly be remiss if we didn't express our appreciation to Bud Wollin for his past leadership and to wish him the best in his future endeavors.



INDUSTRY COMMITTEE ON PACKAGING AND LABELING

Presented by ALFRED E. JOHANSON, Chairman
ICPL, and Counsel, Foremost-McKesson, Inc.

The Industry Committee on Packaging and Labeling is an ad hoc group of over 100 representatives of companies and trade associations in the packaged goods industries. ICPL serves as a communications link between the Conference and the ICPL membership. Accordingly, we are pleased to note that during the past year three of our members have been appointed to the Task Force on Package Control. One of our members also serves on the Study Group on National Weights and Measures System, and another serves on the Study Group on Adoption by Citation. We continue to be well represented on the Associate Membership Committee, and one of our members is on the Liaison Committee.

We do very much appreciate the many existing communication links--both formal and informal--and the generally open attitude of both the Conference membership and the Office of Weights and Measures staff. We nevertheless believe that there is room for improvement and commend to the Conference the proposal that was submitted on behalf of both ICPL and the Associate Membership Committee in July, 1980. Under that proposal the Chairman of the Conference would appoint a representative of the Associate Membership to serve on each of the standing committees: Laws and Regulations; Specifications and Tolerances; and Education, Administration, and Consumer Affairs. We believe this proposal would enable us to serve the Conference better.

ICPL met on Monday of this week. At that meeting we discussed Handbook 133 and appointed a Task Force on the subject. We are pleased that the Handbook has now been published. Obviously a great deal of work went into it and we believe that it will prove to be a very useful document. The purpose of our task force is to assist the Office of Weights and Measures in making the Handbook a living document, one which can be updated periodically to meet the changing needs of the weights and measures community.

At our meeting on Monday we also elected new officers, whose terms will begin at the end of this Conference. Lucien Agniel of the Millers National Federation was elected Chairman. Austin Rhoads was re-elected Secretary-Treasurer. The Vice-Chairmen will be John Elliott, Ralph Miller, Merrill Thompson, and myself.

Our next meeting will be December 15 in Washington.

TASK FORCE ON NATIONAL TYPE APPROVAL

Presented by EZIO DELFINO, Task Force Chairman, Division of
Measurement Standards, State of California

A summary progress report on the current status of the agreement
of reciprocity between OWM and California is as follows:

During calendar year 1980, 87 scales were submitted for type
approval. Twenty-four of those scales were approved under the
reciprocity agreement. Sixty-three of the scales were requested for
California approval only.

From January 1, 1981 to July 1, 1981 a total of 98 scales were
submitted for approval. Seventy-four of those scales were approved
under the reciprocity agreement and only 24 were requested for
California approval only.

Chairman Delfino then introduced Harry E. Lockery and George
Mattimoe who presented status reports as follows.

TASK FORCE ON NATIONAL TYPE APPROVAL TECHNICAL WEIGHING GROUP

Presented by HARRY E. LOCKERY, Hottinger Baldwin
Measurements, Inc.

INTRODUCTION

The Technical Weighing Group is alive and well and working very
hard developing National Type Approval Test Criteria. I very much
appreciate the opportunity to provide you with this status report.

ORGANIZATION

Within the Technical Working Group we have a Weighing Subgroup and
a Liquid Measurements Subgroup.

The Liquid Measurements Subgroup is chaired by Walter Gerdom with
a committee composition of:

Lacy DeGrange (Maryland)
Darrell Guensler (California)
Ross Anderson (New York)
Frank Nagele (New York)
Otto Warnloff (OWM)
Five to six representatives from industry.

Walter Gerdom (Tokheim) has a subgroup within his committee
working on development of check lists for truck mounted meters. This
group is chaired by Bill Key (Tokheim). His group is feeding the main
group with check list material for review and revision.

The weighing subgroup is chaired by myself with the following committee composition:

Otto Warnloff (NBS)
Henry Opperman (NBS)
Ross Anderson (New York)
Lacy DeGrange (Maryland)
Frank Nagele (Michigan)
Chuck Oakley (USDA P & S)
Darrell Guensler (California)
Dennis Mahoney (FGIS)
John Robinson (AAR)
Daryl Tonini (Secretary, SMA)
Art Goldberg (Howe Richardson)
Bill Goodpaster (Murphy Cardinal)
Dick Hurley (Fairbanks Morse)
Tom Stabler (Toledo)

Walt Gerdorn and I are coordinating our efforts to develop similar results, formats, time schedules, etc. We are exchanging meeting minutes to be specifically aware of the other committee's work. Both groups have good membership balance; OWM, States, regulatory agencies, and industry.

There is also active an SMA Verification Subcommittee operating as a technical resource to the industry members of the weighing subgroup. Hence, the industry representatives on the weighing subgroup represent a scale industry consensus of major issues.

OPERATIONS

Both technical subgroups have been using the Type Approval Criteria and Test Procedures Draft Document prepared by OWM in concert with California and FGIS. This document has provided an excellent start and is a good base for our committee work. It's existence has served us at least a year of effort.

We solicited comments on that document from all interested parties. The Weighing Subgroup received a fair number of comments. The Liquid Measurement Subgroup received none, probably because they already have broad industry representation on their committee.

We are holding meetings at the Regional Meetings, the Interim Conference (January), the National Conference (July), and in between, as required. The meetings are attended by the regular committee members and are open to others for observations and comment. We welcome the participation of non-committee members not only in observing our progress but in providing their views, as well.

Our meeting format is as follows:

1. We are going through the Type Approval Criteria and Test Procedures Draft page by page.
2. We first review the written comments which have been submitted.
3. We then review comments from the committee members and outside the committee if such are made.
4. We reach a consensus on each portion of the document. If modification is required we achieve a consensus on the revision and revise the document.
5. Minutes are prepared for each meeting and revisions are made to the Type Approval Criteria Draft which is included as an attachment to the minutes. Hence the draft included with the minutes reflects the results of the committee's work as of that date. The minutes show how we got there.

STATUS

The Weighing Subgroup has had meetings on April 6, May 11, 12, and July 14. The Liquid Measurements Subgroup had meetings on May 12, 13, and July 14.

Walt Gerdorn reports being about 75 percent complete on retail motor fuel devices and about 25 percent complete on meters. This committee hopes to complete their work by the Interim Meeting.

The Weighing Subgroup is about 50 percent complete in their work. We will try to complete our work by the Interim Meeting but that represents a pretty tight schedule. Certainly our work will be completed by the spring of '82.

FUTURE MEETINGS

The Weighing Subgroup will have a two-day meeting either at the Western Meeting in September or shortly thereafter and another two-day meeting at the Southern Meeting. The Liquid Measurements Subgroup will have their next meeting at the Southern Meeting.

CONCLUSION

Good progress is being made in both subgroups. There are excellent positive and cooperative attitudes on the part of all subgroup members. There is an obvious and sincere desire to work out differences and develop a common basis for tests and ultimate type approval. And it is to me, personally, a very great pleasure to work with such a fine and knowledgeable group of people.

TASK FORCE ON NATIONAL TYPE APPROVAL
POLICY WORKING GROUP

Presented by GEORGE E. MATTIMOE, Department of
Agriculture, Weights and Measures, State of Hawaii

OVERVIEW

The initial meeting of the policy working group was followed by the distribution of a "conceptual draft" as expressed by group members at the meeting and subsequent communications shortly thereafter.

A second draft document was circulated early in July for the group's review and comments at the National Conference. It was concluded after the group's second meeting that the "second draft" should be amended to reflect the thoughts, opinions, and recommendations expressed at the National Conference meeting. Committee members, the working group members, and all interested parties were requested to forward their recommendations for inclusion in a "third draft", to the group chairman no later than August 15, 1981.

While copies of the "second draft" were made available at the NBS, it was the desire of the working group that this document be considered an expression of collective ideas rather than a finalized proposal for the administration of a National Type Approval Program (NTAP).

CONCEPT

A proposed nonprofit corporation be established as an adjunct to the National Conference on Weights and Measures. By charter and bylaws, NTAP, Inc. would adopt industry established criteria, which would be incorporated in a contract with the National Bureau of Standards, and serve as the base for the national type approval testing. The Bureau would be free to conduct tests "in-house", or subcontract such testing with any qualified, National Bureau of Standards approved laboratory. Testing criteria presented to NBS under contract will have been evaluated to the requirements of both international and domestic standards.

STRUCTURE

NTAP, Inc. would have a full complement of officers consisting of:

- a) A President who would be exofficio, Chairman of the National Conference of Weights and Measures;
- b) Two Vice Presidents:
 - (1) a Vice President for International affairs, who would be Chief, Office of Domestic and International Standards of NBS, and

- (2) a Vice President for Domestic affairs, who would be Chief, Office of Weights and Measures, NBS.
- c) An Executive Director, who would be a full time employee of NTAP, Inc.
- d) A Secretary-Treasurer who would also be a full time employee.
- e) A Board of Directors.

OBSERVATIONS

The probability of recommending some form of type approval pre-emption language as applies to measuring equipment moving in interstate commerce was discussed. A representative of NBS indicated, unofficially, that it might be feasible and desirable to house NTAP, Inc. within NBS facilities.

The initial industry reaction to the proposed NTAP, Inc. (Administrative) has, in general, been one of acceptance and cooperation.

Despite adverse comments, the working group feels that progress has been made and is confident that a final proposal will be presented to the National Conference on Weights and Measures interim meeting in January 1982 as initially charged.

GEORGE MATTIMOE, Group Chairman (Hawaii)
JOHN BARTFAI (New York)
EDWARD STADOLNIK (Massachusetts)
TOM STABLER (Toledo Scale)
CLAUDE PARENT (Gilbarco, Inc)



NATIONAL SCALE MEN'S ASSOCIATION

Presented by DANIEL J. COCKRELL, President NSMA, and
President, Weighing and Control Systems, Inc.

I wish to thank your chairman, your executive committee, and Harold Wollin on behalf of the National Scale Men's Association for the kind invitation to speak to you today and to relate to you the immediate past happenings of NSMA, as well as where we are today and our plans for the future.

The 62nd Annual Technical Conference and 1981 Equipment Exhibit of NSMA were held at the Hilton Harbour Castle Hotel, Toronto, Canada, from May 17 to 22. It was a most successful conference, and the final attendance figures show just over 1,600 registrations representing the United States, Canada, and Mexico and an additional twenty foreign countries. Sixty-nine percent of those in attendance were from the United States, 27 percent from nine provinces of Canada, and four percent from other countries.

New officers of NSMA were elected by the general membership at the annual meeting and they are: 1st Vice President - James A. King, Jr., President, J. A. King and Co., Greensboro, North Carolina, a member of the Southeast Division; 2nd Vice President - George C. Welch of Dynisco, Norwood, Massachusetts, and a member of the New England Division; Sergeant-at-Arms - Stan Darsey, Chief of the Bureau of Weights and Measures, Florida Department of Agriculture and Consumer Services, Tallahassee, Florida, and a member of the Florida Division.

The immediate past president of NSMA is Raymond Canfield, President of Acme Scale and Supply Co., Pittsburgh, Pennsylvania, and I would like to add that Ray Canfield was awarded the highest honor of NSMA by being selected to receive the "Woody" Woodland award which is given in honor of a man who has contributed in an outstanding manner to the weighing industry.

The 1981 Equipment Exhibit was the largest ever held by NSMA, with 127 booths of 83 exhibitors, and it must be remembered that the vast majority of those exhibitors were required to import their equipment to Canada in order to exhibit. Although it is now only July of 1981, more than 60 percent of the booth space available in Dallas for the 1982 Conference has been reserved.

Membership in NSMA now stands at 2,226, and since January 1, 1981, we have enrolled 226 new members. 1981 has, thus far, been a banner year for NSMA. We announced, with a considerable amount of pride the completion and publication of The Scale Men's Handbook of Metrology. This is a result of a cooperative Industry effort over a period of four years, guided by NSMA's Scaleman's Handbook Committee, with George C. Welch as its chairman. NSMA membership contributed \$22,000 to complete the book which contains 278 pages, more than 250 illustrations and tables, and two appendices. The book, consisting of eight main sections,

covers the full range of mechanical, hydraulic, and electronic scales and measurement systems, including trouble-shooting and calibration as well as tests and tolerances. It is being made available to all those interested in weights and measures at a nominal charge.

We have instituted and established a new committee on behalf of the Board of Directors of NSMA. It is the "Video Training Committee," chaired by Jim King, Jr., and an immediate expenditure of \$5,000 was authorized by the Board of Directors at their meeting in Toronto. This is an exciting undertaking.

The video department of Yuba College in California, a recipient of several scholarships sponsored by NSMA, will produce video cassette technical training modules for the Association's use. Multiple copies of these cassettes will be made for distribution to NSMA Divisions. We will have quality technical information available on a continuing basis for the membership. We have had the opportunity to view the first publication which showed, with graphic detail, the method and simplicity of converting a lever scale to a levertronic. We believe that in 1981 we will complete cassettes on lever theory so that the scale technician will have a working knowledge of levers, calculations, dimensions, pulls, multiples, etc. We also expect a cassette on digital interfaces, dials, etc. during the current year. This just scratches the surface, of course, but with the proliferation of electronic weighing equipment, our intentions are to have a video record and training program available for all technicians. It is a most worthwhile project and has the full backing of the executive committee and board of directors. Our scales on Saturdays and Division and District meetings will become ever more attractive to those who are eager to learn. We foresee a complete lending library of video teaching aids in weighing and measurement.

These are but a few of the exciting happenings in NSMA, and it is exciting to be associated with them.

SCALE MANUFACTURERS ASSOCIATION, INC.

Presented by RAYMOND J. LLOYD, Executive Director, SMA

The Scale Manufacturers Association appreciates this opportunity to bring the members of the National Conference on Weights and Measures up-to-date on our programs and activities. We also appreciate this excellent forum for the exchange of information and views on important matters of common interest.

SMA has elected new officers and directors since the 65th Conference. They are:

President--William H. Perry, president of Cardinal Scale Mfg. Co., Webb City, Missouri.

Vice President--Peter R. Perino, president of Transducers, Inc., Cerritos, California.

Directors, in addition to the officers, are:

Fred H. Katterheinrich, manager of government and industry regulations, Hobart Corporation, Dayton, OH. George N. Krassner, president and general manager, Streeteramet Measurement Systems Division, Mangood Corporation, Grayslake, IL. Harry E. Lockery, president of Hottinger Baldwin Measurements, Inc., Framingham, MA. David B. Patterson, general manager, Toledo Scale Division, Reliance Electric Co., Columbus, OH. Robert M. Zweig, president, John Chatillon & Sons, Inc., Kew Gardens, NY.

SMA's commitment to technical support of the National Conference and the regional weights and measures associations remains firmly in place. Our Technical Committee and staff technical personnel work closely with your organization and with many other groups interested in the weighing industry.

Members of our Technical Committee this year are John W. Aquadro of Howe Richardson Company; Robert E. Callihan of Fairbanks Weighing Division, Colt Industries; John J. Elengo, Jr., of Revere Corp. of America; W. Terry James of Cardinal Scale Mfg. Co.; Fred H. Katterheinrich of Hobart Corporation; Martin C. Spoor of BLH Electronics; Thomas M. Stabler of Toledo Scale Division, Reliance Electric Co.; and James R. Teasdale of Toroid Corporation.

Many of you know Daryl Tonini, our staff technical director and chairman of the Technical Committee. Daryl has been SMA's technical spokesman before the National Conference and other organizations for several years. In addition, we recently appointed Gregory J. Bocchi as SMA's technical assistant. Greg is attending this Conference, and I hope you will meet him before the week is over.

Specific SMA activities of special interest to NCWM include the work of our Tolerance Subcommittee, which has now completed its final draft recommendation for a new U.S. tolerance structure. The draft will be part of the final report of your Committee on Specifications and Tolerances this week, we are advised.

SMA also is very active in your discussions and proposals for a national type approval program. We organized our Verification Subcommittee last year to support this effort. Representatives of our member companies are heavily involved in the project, and a member of the SMA Board, Harry Lockery, is serving as chairman of the working group of weighing devices.

Our publications program took some positive steps this year with the publication of the fourth edition of our industry dictionary, Terms and Definitions for the Weighing Industry. This expanded publication, which now includes terms from Handbook 44 and OIML International Recommendation 3, is available to weights and measure officials at the SMA member price.

You are also familiar, I believe, with our annual membership directory and our bi-monthly newsletter, The Weighlog. Copies of each of these publications are sent to weights and measures officials from time to time.

A new development of interest to the weighing industry is the discussion in Congress on the Organic Act for the National Bureau of Standards, starting with hearings in June before the House Subcommittee on Science, Research, and Technology. Kenneth F. Hammer, a past president of SMA, presented testimony on behalf of SMA at these hearings. Our Board of Directors approved a proposal this week that our Association follow up the hearings by preparing an official SMA position on the strengthening of weights and measure programs in the U.S.

In concluding these brief remarks, SMA would like to recognize Harold F. Wollin, Executive Secretary of the National Conference, who has announced that he will leave Government service this summer after a long career in weights and measures. SMA has worked closely with Harold, through both the Office of Weights and Measures and the NCWM. We deeply appreciate his understanding, his willingness to work with industry where possible, and his major contributions to weights and measures. We will miss you, Harold, and we wish you well in your new career.

65th National Conference on Weights & Measures

STATE REPRESENTATIVES

The following is a list of designated State representatives who were present and voting on the reports presented by the Conference standing and annual committees:

<u>State</u>	<u>Representative</u>	<u>Alternate</u>
1. Alabama (AL)	Don Stagg	John Rabb
2. Alaska (AK)	Joseph L. Swanson	---
3. Arizona (AZ)	P. M. Fullinwider	D. L. Sorensen
4. Arkansas (AR)	Sam F. Hindsman	Ed Holiman
5. California (CA)	Ezio F. Delfino	Darrell A. Guensler
6. Colorado (CO)	Leo Letey	---
7. Connecticut (CT)	John Bennett	William J. Slamon, Jr.
8. Delaware (DE)	Eugene Keeley	---
9. District of Columbia (DC)	Absent	Stan Darsey
10. Florida (FL)	Syd Andrews	---
11. Georgia (GA)	Tom Kirby	Martin Coile
12. Hawaii (HI)	George Mattimoe	Leland Tom
13. Idaho (ID)	Lyman D. Holloway	A. Dale Hurd
14. Illinois (IL)	Sidney A. Colbrook	Wayne W. Behrns
15. Indiana (IN)	Robert W. Walker	M. Morris Thompson
16. Iowa (IA)	James M. O'Connor	Robert E. Hollis
17. Kansas (KS)	John L. O'Neill	Donald L. Lynch
18. Kentucky (KY)	Ron Egnew	Charles Prebble
19. Louisiana (LA)	Philip A. Stagg	James L. Mahomes
20. Maine (ME)	Gaylon M. Kennedy	Marshall White
21. Maryland (MD)	Richard L. Thompson	Lacy H. DeGrange
22. Massachusetts (MA)	Edward H. Stadolnik	Charles H. Carroll
23. Michigan (MI)	Edward C. Heffron	Frank Nagele
24. Minnesota (MN)	Edward P. Skluzacek	George W. McDonald
25. Mississippi (MS)	William Eldridge	James H. Spencer
26. Missouri (MO)	J. W. Abbott	---
27. Montana (MT)	Gary Delano	---
28. Nebraska (NE)	John Alloway	Rich Suiter
29. Nevada (NV)	Absent	---
30. New Hampshire (NH)	Walter J. Tusen	---
31. New Jersey (NJ)	James R. Bird	---
32. New Mexico (NM)	Fred Gerk	Charles Greene
33. New York (NY)	John J. Bartfai	Kenneth R. Gridley
34. North Carolina (NC)	N. David Smith	Tom Scott
35. North Dakota (ND)	Bruce Niebergal	---
36. Ohio (OH)	Fred Clem	Tom Prager
37. Oklahoma (OK)	George M. Parker	H. H. Latham
38. Oregon (OR)	Kendrick J. Simila	Leo Weber
39. Pennsylvania (PA)	Fred A. Thomas	---
40. Puerto Rico (PR)	Maria A. Maldonado	Juan A. Rios
41. Rhode Island (RI)	Absent	---
42. South Carolina (SC)	John Pugh	---
43. South Dakota (SD)	Allen Christie	---
44. Tennessee (TN)	John Shelton	Robert G. Williams
45. Texas (TX)	Bobby Champion	Charles Forester
46. Utah (UT)	Edison Stephens	Archie S. Hurst
47. Vermont (VT)	Trafford F. Brink	Douglas Jones, Sr.
48. Virginia (VA)	James F. Lyles	Marion W. Cain
49. Virgin Islands (VI)	Angel L. Lebron	---
50. Washington (WA)	Gunnar Magnuson	William C. Sullivan
51. West Virginia (WV)	Kenneth Butcher	Lawrence Barker
52. Wisconsin (WI)	Robert Probst	---
53. Wyoming (WY)	Absent	---



REPORT OF THE COMMITTEE ON NATIONAL MEASUREMENT
POLICY AND COORDINATION

Presented by EDWARD H. STADOLNIK, Assistant Director,
Division of Standards, State of Massachusetts

(Thursday, July 16, 1981)

VOTING KEY

100

INTRODUCTION

The Committee on National Measurement Policy and Coordination (P & C Committee) submits its final report to the 66th National Conference on Weights and Measures (NCWM). The report represents recommendations of the committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the committee.

101

FINAL REPORT OF THE SPECIAL STUDY GROUP
ON ENFORCEMENT UNIFORMITY

One of the fundamental objectives of the National Conference on Weights and Measures is to encourage and promote uniformity of requirements and practices among jurisdictions. The NCWM has achieved considerable success in developing, and seeing through to their adoption, various model State laws and regulations used in the enforcement of measurement standards requirements by the States, counties, cities, and territories. It is apparent, however, that the enforcement practices and procedures actually employed by the different jurisdictions have significantly affected the actual level of uniformity achieved in the field.

Concern about the long-term implications of nonuniformity in weights and measures enforcement at the State and local level led to the appointment during the past year of this special study group by the Conference Chairman, Charles Vincent. The study group, consisting of four weights and measures officials and four members from industry, first met during the NCWM interim meetings of the Conference standing committees last January.

The identified goal or purpose of the Study Group is to achieve a high degree of uniformity in weights and measures enforcement policies and practices. In recognition of the extremely wide range of measurement standards responsibilities that weights and measures jurisdictions have throughout the United States, the initial scope of the Study Group's efforts was deliberately limited to issues involving enforcement practices pertaining to packaged products. It was felt that the Group's involvement in other areas where weights and measures uniformity of enforcement is an issue may be appropriate or desirable, but only after the issue of uniform package control has been adequately addressed.

OBJECTIVES

The Study Group determined three fundamental objectives that, when satisfied, would contribute toward meeting its goal. These objectives are:

- 1) To identify the net-content enforcement practices of the States and principal local jurisdictions.
- 2) To identify the degree of consistency or uniformity in the enforcement practices among these jurisdictions.
- 3) To recommend to the National Conference on Weights and Measures through the Committee on National Measurement Policy and Coordination, ways and means of increasing the degree of uniformity among the various jurisdictions.

The approach taken toward fulfilling objectives 1 and 2 was to develop and send to all the State-level and to 15 of the principal local weights and measures jurisdictions a questionnaire about their package enforcement programs. Analysis of the information received from these jurisdictions will serve as a basis for developing recommendations to fulfill the third objective.

SURVEY RESULTS

Ninety-eight percent (52 of 53) of the State-level weights and measures jurisdictions and 73 percent (11 of 15) of the local jurisdictions responded to the Study Group's four-page Enforcement Policy and Practice Questionnaire. This was a very encouraging overall response of 93 percent (63 of 68).

The questionnaire developed by the Study Group was designed to collect information about the net-content, package-inspection programs utilized by weights and measures officials. The questions were divided into four areas which included:

- 1) Identification of the net-content compliance standards utilized by each jurisdiction.
- 2) How these standards are interpreted and applied.
- 3) Action taken when evidence of low net-content is found.
- 4) Frequency of enforcement options utilized.

The results as herein reported consist of a summary of the responses to each question and are shown in tables bearing the question number. In general, the results indicate that although there is a reasonably high degree of uniformity with regard to established package-compliance standards, there is a significant amount of variation in how these standards are interpreted and implemented. By

standards, we mean official net-content compliance requirements and not physical-test standards.

The first question asked, "What are the package net-content standards of your State or jurisdiction?" The responses are shown in table 1A. Fifty-nine of the 63 respondents answered this question. Upon close examination of the "other standards" submitted as copies to the Study Group, we found that several included the provisions contained in the National Bureau of Standards Handbook 67. In fact, overall, 52 of the 59 or 88 percent of those responding utilized the provisions of Handbook 67.

TABLE 1A
WHAT ARE THE PACKAGE NET-CONTENT STANDARDS OF
YOUR STATE OR JURISDICTION?

<u>Standards Used</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
1. NBS Handbook 67 Only	26	7	33
2. Other Standards	15	1	16
3. Combination of Both HB 67 and Other Standards	<u>8</u>	<u>2</u>	<u>20</u>
Total:	49	10	59

Table 1B summarizes the responses to the question "How were these standards adopted? Fifteen respondents indicated more than one method were used to adopt the standards. Over 70 percent indicated that the standards received official legal recognition by nature of the fact that legislative acts or administrative rule were utilized to adopt them.

TABLE 1B
HOW WERE STANDARDS ADOPTED?

<u>Method of Adoption</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
Legislative Act	31	5	36
Administrative Rule	16	3	19
Local Ordinance	0	6	6
Policy Decision	13	0	13

Table 1C summarizes the responses to the question "Are the State package net-content standards uniformly enforced throughout your jurisdiction? As one would expect, there was high degree of implied uniformity. However, the responses of the States usually excluded reference to large metropolitan jurisdictions within the State where

separate weights and measures offices exist or where Federal jurisdictions such as the USDA or FDA were involved. Most States strive for uniformity but recognize that deviations exist.

TABLE 1C
ARE STANDARDS ENFORCED UNIFORMLY THROUGHOUT JURISDICTION?

<u>Response</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
Yes	45	9	54
No	<u>6</u>	<u>1</u>	<u>7</u>
Total:	51	10	61

Table 1D shows the responses to the question, "If local net-content standards are enforced, do they conform to the State standards?" For those States where no local standards exist, the response "not applicable" was used. We also recognize that some local jurisdictions may conform to the State standards but may also go beyond them by enforcing more rigorous standards.

TABLE 1D
DO LOCAL STANDARDS CONFORM TO STATE STANDARDS?

<u>Response</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
Yes	23	11	34
No	0	0	0
Not Applicable	<u>28</u>	<u>0</u>	<u>28</u>
Total:	51	11	62

Table 2A-C summarizes the responses to the questions concerning the amount (percent) of the total weights and measures activity devoted to net-content enforcement of standard packages. The question asked first identified the percent of the total weights and measures activity devoted to package-control programs. Then, what percent of the package-control activity was devoted to standard-package programs? Finally, what percent of the standard-package programs was devoted to net-content enforcement?

TABLE 2A-C
PERCENT OF ACTIVITY DEVOTED TO PACKAGE CONTROL PROGRAMS

Weights and Measures Activity Breakdown	Juris- diction	Av. %	Number Responding by Percentage Class						Number Responses
			0%-9%	10%-19%	20%-29%	30%-39%	40%-49%	50%+	
A. Percent of total activity devoted to Package Control Programs	State	32	4	8	16	6	7	10	51
	Local	39	0	1	3	1	2	4	11
	Total	33	4	9	19	7	9	14	62
B. Percent of Package Control Activity devoted to Stan- dard Package Programs	State	27	11	13	8	3	3	3	51
	Local	38	0	4	1	1	0	5	11
	Total	29	11	17	9	4	3	18	62
C. Percent of Standard Package Programs devoted to Net- Content Enforcement	State	42	11	6	8	4	1	20	50
	Local	64	1	1	0	0	0	9	11
	Total	46	12	7	8	4	1	29	61

	Juris.	Av.	Number Responding by Percentage Class					No Response
			<1%	1%-3%	4%-7%	8%-10%	>10%	
Computed Total Activity devoted to Net-Content Enforcement of Standard Packages (AxExC)	State	6	21	10	6	6	7	50
	Local	13	2	2	3	1	3	11
	Total	7	23	12	9	7	10	61

By multiplying these three percentages together, we inferred for each respondent what percent of their total activity was devoted to the net-content enforcement of standard packages. The results indicate that the average portion of all weights and measures activities spent on this effort is approximately 7 percent. We recognize that this may be a rough estimate and that the range of individual responses varied from less than 1 percent to over 40 percent.

The next four questions were designed to identify how the standards are interpreted and applied. Table 2D summarizes the responses to the question "If a group of 34 packages on a shelf has two different date codes, one with 9 containers, the other with 25 containers, how would you choose the items for an inspection sample?" This question was intended to see whether an inspection lot at retail is composed of a single-date code or a composite of date codes. Eighty-five percent of the respondents indicated they would draw two separate samples, one from each date code.

TABLE 2D
HOW WOULD AN INSPECTION SAMPLE BE CHOSEN?

<u>Response</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
Draw one inspection sample, combining both date codes	8	1	9
Draw two inspection samples, one from each date code	<u>43</u>	<u>10</u>	<u>53</u>
Total:	51	11	62

Table 3A shows the responses to the question "What is your lot acceptance/rejection criterion based on?" The results indicate that 82 percent of the respondents utilize both the sample average and individual errors as the basis, while 10 percent utilize only one criterion.

The information in table 3B summarizes the responses to the question "If an inspection sample of packages with a declared net weight of 12 oz has an average net weight of 12.05 oz but two of the containers have a net weight of 11.65 oz, what would you conclude about the lot?" These results are cross-tabulated with the responses to question 3A on lot acceptance criteria. The objective of this question (3B) was to see how a sample with an acceptable average net weight and two unreasonable individual minus errors (underfills) would be considered. It is interesting to note that in table 3A, 84 percent (52 out of 62) indicated that unreasonable individual errors were used as a basis for lot acceptance (rejection). However, in question 3B, 34 percent (21 out of 62) indicated they would pass the

lot and only 34 percent (21 out of 62) indicated they would fail the lot even though there was an excessive number of unreasonable individual errors in the inspection sample.

TABLE 3A
LOT ACCEPTANCE/REJECTION CRITERIA

Response	Number Responding		
	State	Local	Total
Sample average only	5	0	5
Individual unreasonable errors only	1	0	1
Both sample average and unreasonable individual errors	41	10	51
Other basis	<u>4</u>	<u>1</u>	<u>5</u>
Total:	51	11	62

TABLE 3B
CROSS TABULATION OF LOT ACCEPTANCE CRITERIA (3A) AND THE DISPOSITION
OF A LOT WITH EXCESSIVE NUMBER OF UNREASONABLE UNDERFILLS (3B)

Lot Acceptance Criterion	LOT DISPOSITION							
	Pass		Take More		Mark Samples		Fail	
	Lot		Samples		Off-sale		Lot	
	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>
Sample average only	3	0					1	0
Individual underfills					1	0		
Both average and individual underfills	10	5	6	1			18	2
Other basis	2	1	2	0				
Total:	<u>15</u>	<u>6</u>	<u>8</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>19</u>	<u>2</u>

Table 3C summarizes the responses to the question "If an inspection sample of 12 oz containers has an average net weight of 11.98 oz, what would you conclude about the lot sampled?" The objective of this question was to see how a sample with a low average net weight would be considered. These results are also cross-tabulated with the

responses to question 3A. Table 3A indicated that 90 percent (56 out of 62) used the sample average as a basis for lot acceptance/rejection but only 56 percent (35 out of 63) of the responses to this question noted that they would fail the lot.

TABLE 3C
CROSS TABULATION OF LOT ACCEPTANCE CRITERIA (3A) AND THE
DISPOSITION OF A LOT WITH LOW AVERAGE NET WEIGHT 3B

Lot Acceptance Criteria	LOT DISPOSITION									
	Pass		Take More		Mark Samples		Fail		None of	
	Lot		Samples		Off-sale		Lot		the Above	
	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>	<u>S</u>	<u>L</u>
Sample average only	1	0					2	0	2	0
Individual underfills							1	0		
Both average and individual underfills	4	4	2	1	1	0	27	5	8	0
Other basis	1	0	1	0	1	0			1	1
Total:	<u>6</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>30</u>	<u>5</u>	<u>11</u>	<u>1</u>

Tables 3B and 3C highlight the fact that the lack of uniformity is greatest in the interpretation and application of the standards and not in the standards themselves.

The responses to question 4A, which sought to identify under what conditions various enforcement options would be exercised, are not included here for the sake of brevity.

Table 4B highlights the frequency with which the various enforcement options are utilized. For the purpose of clarification an assurance of voluntary compliance plea is a consent order, one in which a business admits no wrongdoing but agrees to comply; a civil penalty involves monetary but no criminal implications; prosecution is charging noncompliance under misdemeanor or felony statutes; and an injunction is a court order. We see that marking containers off-sale and warnings are used most frequently and that injunctions and civil penalties are used the least.

TABLE 4B

FREQUENCY OF ENFORCEMENT OPTIONS UTILIZED

<u>Option</u>	<u>Juris- diction</u>	<u>Number Responding</u>		
		<u>Never</u>	<u>Sometimes</u>	<u>Always</u>
1. Marking Containers Off-Sale	<u>State</u>	0	19	33
	<u>Local</u>	0	3	8
2. Warnings	<u>State</u>	0	26	26
	<u>Local</u>	0	4	7
3. Assurance of Volun- tary Compliance Plea	<u>State</u>	11	21	15
	<u>Local</u>	1	6	4
4. Administrative Hearings	<u>State</u>	17	30	2
	<u>Local</u>	2	7	2
5. Civil Penalties	<u>State</u>	22	21	1
	<u>Local</u>	8	3	0
6. Injunction	<u>State</u>	21	21	0
	<u>Local</u>	3	8	0
7. Prosecution	<u>State</u>	6	42	0
	<u>Local</u>	0	9	2
8. Other	<u>State</u>	4	8	0
	<u>Local</u>	1	1	0

Table 4C summarizes the responses to the question "If an inspection sample fails your enforcement requirements, would you take a second sample to confirm your findings before taking legal action?" Eighty-seven percent of those responding indicated that a second confirmation sample would be taken. This implies that many officials use a screening approach where the initial sample is used to identify potential lots in violation and the second sample is used to confirm the findings.

TABLE 4C

IF SAMPLE FAILS COMPLIANCE STANDARD, WOULD A SECOND
CONFIRMATION SAMPLE BE TAKEN BEFORE TAKING LEGAL ACTION?

<u>Response</u>	<u>Number Responding</u>		
	<u>State</u>	<u>Local</u>	<u>Total</u>
Yes	45	10	55
No	<u>7</u>	<u>1</u>	<u>8</u>
Total:	52	11	63

The preliminary results of our survey summarized in the 11 preceding tables indicate that uniform standards would be helpful in insuring uniform-compliance practices but it will not guarantee such practices. Attention must be focused on training of officials and their understanding of these standards. Further recognition must be given to the political pressures of the job, attitude of the officials, and other factors affecting motivation, before any real uniformity in practice can be achieved.

LACK OF UNIFORMITY, PROBLEM AREAS

Review and analysis of the survey information indicate that nonuniformity or a lack of consistency in the net-content enforcement practices of the States and local jurisdictions is not a simple, single-faceted problem. Rather, the contributing factors to this broad issue are many. For purposes of focusing attention on specific problem areas where study group recommendations can be made, we have identified six categories within the overall nonuniformity issue. These include:

- 1) Laws and Regulations (and net-contents compliance standards* of the jurisdictions, however explicit);
- 2) Method of Adoption (factors affecting uniformity because of the way the various jurisdictions adopt their net-contents standards);
- 3) Interpretation and application (factors affecting uniformity because of differing interpretations and application of requirements);
- 4) Resource Availability (nonuniformity that is attributable to variations among the jurisdictions in terms of the personnel, test equipment, and other resources employed);
- 5) Enforcement practices (nonuniformity or the appearance of nonuniformity in net-contents enforcement that arises because of disparate end results);
- 6) Other Factors.

*Standards here again is used in the "software" sense, i.e., laws, regulations, policies, procedures, specifications, etc., as opposed to "hardware," i.e., weights, devices, etc.

In-depth consideration of the principal factors in these six categories that affect the degree of consistency in net-content enforcement among the States follows.

LAWS AND REGULATIONS

Clearly the net-contents compliance standards enacted, promulgated, adopted, or used by the jurisdictions are an important factor in determining whether or not uniformity or consistency exists in net-contents enforcement of packaged products. In terms of the reported results from the survey (Table 1A), a large majority (73 percent) of the jurisdictions responding indicated that their package net-content standards were based either on the model law and regulations and NBS Handbook 67 or on a combination of both H-67 and other standards. This still leaves a substantial number of jurisdictions (27 percent) that have established or use standards that are different. While some of these "other standards" may in fact be wholly or partially consistent with the H-67 based standards of the majority, many clearly are not.

A corollary to the factor of differing State and local jurisdictions' net-content compliance standards, is the issue of inconsistent and nonuniform Federal agency compliance standards. While an in-depth examination of the differences that exist at the Federal level was not included in this study, differences in the various Federal standards also make up a part of the overall uniformity problem. At least six Federal executive agencies have some involvement in the establishment of net-content compliance standards for packaged products. Included in this number are United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) (the principal two), with more limited involvement of the Federal Trade Commission (FTC), Environmental Protection Agency (EPA), Bureau of Alcohol, Tobacco, and Firearms (BATF), and Department of Commerce (National Marine Fisheries Service).

METHOD OF ADOPTION

The methods by which the various State and local jurisdictions adopt, promulgate, or establish their package net-content standards have an effect on the uniformity of net-content compliance practices. These methods range from the extremes of informality where no formal standards have been established by any means and all package net-content compliance testing is done on an individual case-by-case basis, to the very formal procedure wherein all standards must be enacted by specific legislative act. Table 1B shows that at the State level 21 percent of the adoptions were informal (by policy decision), 52 percent were very formally established by legislative act, and 27 percent were promulgated by the middle course of administrative rule-making.

The particular significance of the method of adoption of the compliance standards to the uniformity question lies mainly in two opposite ends of the adoption spectrum, the very informal "policy decision" approach, and the very formal "legislative act" approach.

The informal "policy decision" approach can be a uniformity problem from the standpoint that "what is the standard" at any given time and in any given situation can vary with the same personnel. With changes in personnel at the policy making level, the package compliance standards can be expected to fluctuate even more.

The very formal (legislative act) approach to adoption of compliance standards can also affect uniformity, but in different ways. Legislatively adopted or promulgated standards are susceptible to being nonuniform from two standpoints. One difficulty with legislatively adopted standards can be their lack of specificity. An example is legislative language allowing "reasonable variations" from declared net-contents, yet without provision for an administrative agency to adopt rules on or further define the term. A second problem area with legislative adoption is the rigidity of the process, the antithesis of the information "policy decision" method. State legislation, for a variety of reasons, can be very difficult to update or amend on a timely basis. It is not uncommon to see State statutes dealing with measurement standards on the book unamended for 10, 20, or even 30 years or more.

INTERPRETATION AND APPLICATION

Information from the study group survey questionnaire supports a conclusion that the largest area of nonuniformity in net-content compliance activities of packaged products at the State and local level includes factors involving interpretation and application of standards and associated test methods.

We refer again to survey data (Table 1A--Standards Used) that show that 69 percent of the State level jurisdictions and 90 percent of the local level jurisdictions responding reportedly use NBS Handbook 67 alone or in combination with other standards in judging compliance of packaged products. When it came to interpreting or applying those standards in two hypothetical inspection situations, however, a substantial number of jurisdictions indicated conclusions that are at odds with what their table 1A and table 3A (Lot Acceptance/Rejection Criteria) responses suggest.

For example, in table 3A, at least 82 percent of the State level jurisdictions and 91 percent of the local level jurisdictions responded that a lot of packages being checked for net-content compliance could be rejected for excessive unreasonable individual package errors, even with a plus average for the lot. When given a sample from an inspection lot that fits this criterion, however, as shown in table 3B, only 44 percent of the State level jurisdictions and 20 percent of the local level jurisdictions concluded they would immediately

fail the lot. Moreover, a surprising 26 percent of the States and 50 percent of the local jurisdictions reported they would even pass the lot.

Similarly in table 3A, at least 90 percent of the State level jurisdictions and 91 percent of the local level jurisdictions indicated that a lot of packages could be rejected with a minus average sample net weight. When given a sample from an inspection lot that fits this criterion, however, as shown in table 3C only 62 percent of the State level jurisdictions and 50 percent of the local level jurisdictions concluded they would immediately fail the lot. Moreover, a surprising 11 percent of the States and 40 percent of the local jurisdictions reported they would even pass the lot.

The two preceding examples are indicative of considerably non-uniformity in interpretation and/or application of package net-content compliance standards. The survey data also include several instances where interpretation and/or application of the package net-content compliance standards by local jurisdictions differed from that by State jurisdictions in situations where each had previously identified that they had identical compliance standards.

Some of the factors that contribute to the apparent lack of uniformity between some of the jurisdictions involved in the interpretation and application of net-content compliance standards include:

- 1) The degree of knowledge and familiarity of administrative personnel with their jurisdiction's net-content compliance standards, including the terminology, sampling requirements, acceptance/rejection criteria, etc.
- 2) The amount and quality of training given and supervision exercised over field personnel in applying the jurisdiction's net-content compliance standards and associated test methods.
- 3) The frequent absence of concise, easy-to-follow written policies within a jurisdiction giving consistent procedural guidance or setting uniform statistical limits for commonly encountered inspection situations.
- 4) Direct or indirect pressures or influences of a political or economic nature within a jurisdiction that affect its approach to net-content compliance checking.
- 5) Regional, cultural, and organizational differences that similarly affect or influence package content programs within a jurisdiction.

RESOURCES AVAILABLE

The degree to which both personnel and equipment resources is available for net-content compliance checking in jurisdictions is another influence on the level of uniformity achieved in enforcement practices.

The survey results illustrate a wide disparity (from 5 percent to 50 percent) in the amount and frequency of personnel (inspector) resources devoted to package control in general, and an even wider disparity (from less than 1 percent to more than 10 percent) in personnel resources devoted to net-content enforcement of standard pack items in particular.

The area of regulatory agency compliance testing equipment, while not dealt with in the survey, may also be a problem in the resource availability area. Specifically a need is recognized for sufficiently detailed uniform national guidelines for the jurisdiction on minimum requirements for package compliance test equipment including:

- 1) mechanical balances,
- 2) mass standards,
- 3) electronic scales and balances,
- 4) volumetric glassware, and
- 5) linear measures.

ENFORCEMENT PRACTICES

Enforcement practices, or what jurisdictions do after package net-content compliance field testing data have been gathered on packages being inspected, is another factor in the overall uniformity issue.

For example, several different jurisdictions may find similar inspection results during field inspection of packaged products and reach the same compliance conclusion to reject the lot, but because their official response to the violations detected results in differing enforcement practices there can be a perception (particularly among industry) that the standards their products must meet are somehow different in different locales. Why else, they may ask, are they (for products from the same production source and lot) simply cautioned in jurisdiction A, allowed to relabel merchandise in jurisdiction B, required to destroy the product in jurisdiction C, required to pay stiff civil penalties in jurisdiction D, and oh yes, not even be checked in jurisdiction E nearby.

Obviously what is being observed in such instances are principally differences in corrective action alternatives, penalties, sanctions, and/or other authorized enforcement tools. Moreover, where the authorized tools are the same there may be different administrative or enforcement philosophies between or even within jurisdictions.

OTHER FACTORS

The overall level of uniformity in net-content compliance practices of packaged products is influenced by factors in addition to those described above. Some others include:

- 1) the sheer number and scope of jurisdictions involved;
- 2) differences in program emphasis and policies by the Federal/State/local jurisdictions with package label enforcement responsibility.

PROPOSED RECOMMENDATIONS

LAWS AND REGULATIONS

- 1) NCWM and jurisdictions should continue to push vigorously for a single Federal and State net-content compliance standard and associated test procedures such as the Proposed National Bureau of Standards Handbook 133 as outlined in the NBS memo on Handbook H-133 dated August 9, 1978, that go down to the retail level and include a significant role for State and local weights and measures officials.
- 2) A short, easy-to-follow, step-by-step pocket manual of the sampling and examination procedures contained in H-133 should be developed for field use.
- 3) NCWM should strongly encourage jurisdictions to adopt NCWM endorsed net-content standards without substantive modification (more stringent or less stringent), and work tirelessly to amend their requirements when such past adoption, for whatever reason, has not been consistent.
- 4) Substantial conformance with NCWM models should be rated as a significant plus factor in the evolving NCWM Program Evaluation of jurisdictions (being developed by the Education Committee) and increasing deviation from the NCWM Models should be rated with a progressively increasing negative factor.
- 5) The net-content inspection policies and proposals of other countries, particularly those of the European Economic Council and OIML should be evaluated. Those aspects of the policies and proposals that improve our own standards should be considered for adoption.
- 6) The NCWM should actively participate in the formulation of U.S. National positions on OIML and other international packaging compliance standards.

METHOD OF ADOPTION

Whereas package compliance standards and regulations can be found in several different documents, they should be combined into a single document for adoption by administrative rule making.

INTERPRETATION AND APPLICATION

- 1) NCWM should put high priority on supporting uniform training at all levels for weights and measures personnel in package net-content checking procedures.
- 2) NCWM should develop a training program on net-content inspection similar to Canada's modular approach (to include all relevant subjects such as basic statistics, statistical methods, sampling techniques, terminology, handling and use of field standards and test equipment, data recording and computation, tare taking, recognizing and eliminating sources of error, etc.) and train instructors in each State who can, in turn, train the inspectors in their own jurisdictions.
- 3) NCWM should develop appropriate net-content compliance checking guidelines where necessary to amplify or bridge the gaps in the net-content compliance standards and associated test procedures.
- 4) NCWM should include significant plus factors in the evolving Program Evaluation of jurisdictions by the NCWM when the jurisdictions have adopted the training programs or guidelines as indicated above.
- 5) NCWM should use appropriate mechanisms available to it to actively discourage any and all political, economic, regional, cultural, or organizational factors that tend to denigrate a uniform approach to net-content compliance practices.

RESOURCES AVAILABLE

- 1) NCWM should develop guidelines for balancing legal metrology activities within jurisdictions so that net-content compliance practices suffer neither from insufficient activity level that makes them meaningless nor from an excessive concentration to the detriment of adequate activity in other programs.
- 2) NCWM should develop suggested minimum requirements for package compliance test equipment.

ENFORCEMENT ACTIONS

- 1) NCWM should develop guidelines for corrective and legal action when net-content compliance violations are detected, such as contained in Los Angeles County, California Procedures 1870.13 and 1970.34.
- 2) NCWM should include enforcement actions that are consistent with those developed under 1) above as a plus in the Evaluation Program of jurisdictions and that negatively rate those enforcement approaches that are unnecessarily lenient or overreactive.

- 3) NCWM should support training in uniform enforcement actions among the subjects to be included in professional and technical training for measurement practitioners.

Submitted by:

C. KLOOS, Hunt-Wesson, Cochairman
K. SIMILA, State of Oregon, Cochairman
J. BIRD, State of New Jersey
C. GREENE, State of New Mexico
G. HAGOPIAN, Proctor and Gamble
A. RHOADS, Milk Industry Foundation
R. THOMPSON, State of Maryland
E. WOLSKI, Colgate-Palmolive

Special Study Group of Enforcement Uniformity

With the submission of this final report the activity of the Special Study Group on Enforcement Uniformity as originally planned has been completed. However, several members of the study group will participate in a new study of the National Weights and Measures System which is described in the following item 102. The recommendations in this final report will be addressed by a successor Task Force on Package Control.

The Conference wishes to give special thanks to Co-chairmen Ken Simila and Chip Kloos for their considerable effort in this project and for the excellence of their report.

(Item 101 was adopted)

102

NATIONAL WEIGHTS AND MEASURES SYSTEM

Last year the Committee on National Measurement Policy and Coordination reported that because of social, economic, and technological changes that have occurred during recent years there is a need for the National Conference on Weights and Measures (NCWM) to play a more active and aggressive role in shaping the future of weights and measures administration in the United States. In response to the need, the Committee considered it important to initiate consideration of issues that would be fundamental to the growth and improvement of the Nation's weights and measures system.

The Conference adopted the Committee's report which contained a recommendation to form a special study group to carry on the effort begun last year. The special study group was established just prior to the interim committee meetings and the members who attended the meetings at Texas A & M met on several occasions to organize and initiate plans for their studies in the future.

Members of the special study group include representatives from each regional weights and measures association and segments of the associate membership. They are: James R. Bird, New Jersey Weights and Measures (Chairman); Ezio Delfino, California Division of Measurement Standards; Walter F. Gerdorn, Jr., Tokheim Corporation; Charles H. Greene, New Mexico Department of Agriculture; Dick Hurley, Fairbanks Weighing; Alfred E. Johanson, Foremost-McKesson, Inc.; Chip Kloos, Hunt-Wesson Foods, Inc.; Dr. Louis S. Meyer, Conference of Consumer Organizations; Robert W. Probst, Wisconsin Bureau of Weights and Measures; Kendrick J. Simila, Oregon Weights and Measures; Thomas M. Stabler, Toledo Scale Company; Edward H. Stadolnik, Massachusetts Division of Standards; Richard L. Thompson, Maryland Weights and Measures; and Charles H. Vincent, Dallas Department of Consumer Affairs.

The following is a summary of the plans developed by the study group at the interim meetings:

A. Objective:

To evaluate the system of weights and measures in the United States and develop elements of a weights and measures system to meet the needs of today and into the 1990's. Major components of this system will include the following categories:

- A. Administration and Enforcement
- B. Metrology Laboratory Facilities and Programs
- C. Device Control and Verification
- D. Package Control and Verification.

B. Activity Plan:

A special Task Force on Package Control was established to continue and broaden the work completed by the Special Study Group on Enforcement Uniformity as reported on previously in this report (item 101). The task force will concentrate its initial activity on the following recommendations of the Study Group on Enforcement Uniformity.

LAWS AND REGULATIONS

- 1) A short, easy-to-follow, step-by-step pocket manual of the sampling and examination procedures contained in H-133 should be developed for field use.
- 2) The net-content inspection policies and proposals of other countries, particularly those of the European Economic Community

and OIML should be evaluated. Those aspects of the policies and proposals that improve our own standards should be considered for adoption.

- 3) The NCWM should actively participate in the formulation of U.S. National positions on OIML and other international packaging compliance standards.

METHOD OF ADOPTION

Whereas package compliance standards and regulations can be found in several different documents, they should be combined into a single document for adoption by administrative rule making.

INTERPRETATION AND APPLICATION

- 1) NCWM should develop a training program on net-content inspection similar to Canada's modular approach (to include all relevant subjects such as basic statistics, statistical methods, sampling techniques, terminology, handling and use of field standards and test equipment, data recording and computation, tare taking, recognizing and eliminating sources of error, etc.), and train instructors in each State who can, in turn, train the inspectors in their own jurisdiction.
- 2) NCWM should develop appropriate net-content compliance checking guidelines where necessary to amplify or bridge the gaps in the net-content compliance standards and associated test procedures.

RESOURCES AVAILABLE

NCWM should develop NCWM guidelines for balancing legal metrology activities within jurisdictions so that net-content compliance practices suffer neither from an insufficient activity level that makes them meaningless nor from excessive concentration to the detriment of adequate activity in other programs.

ENFORCEMENT ACTIONS

NCWM should develop NCWM guidelines for corrective and legal action when net-content compliance violations are detected, such as contained in Los Angeles County, California Procedures 1870.31 and 1870.34.

Members of the task force are: Kendrick J. Simila (Co-chairman), Oregon Weights and Measures; Alfred E. Johanson (Co-chairman), Foremost McKesson, Inc. (also Chairman, Industry Committee on Packaging and Labeling); Lucien Agniel, Miller's National Federation; Robert Belliveau, Proctor & Gamble; Chip Kloos, Hunt-Wesson Foods; Dan Smith, Santa Clara County, California; Don Stagg, State of Alabama; Charles Vincent, Dallas Department of Consumer Affairs.

C. Future Approach:

The study group will review and evaluate such other matters as:

- 1) Written comments received on the ten questions listed in item 101, 65th NCWM Report.
- 2) Report of the Pilot Peer Evaluation conducted by the Committee on Education, Administration, and Consumer Affairs of four jurisdictions.
- 3) National Bureau of Standards State Measurement Needs Study.
- 4) OIML International Document, "Principles of Assurance of Metrological Control" (PS22,RS6).
- 5) SMA recommendation for a Legal Metrology Control System.
- 6) Documents, reports, and articles with contributing information.

In addition, all subjects perceived to be within the purview and scope of the study group that are under investigation by other committees of the NCWM will be considered in preparing a proposed model weights and measures system.

The study group realizes that a clear understanding of the prevailing conditions and of future needs is necessary to develop the model system. Consequently, we solicit appropriate comments and recommendations for consideration from all interested parties.

On June 18, 1981, Mr. James R. Bird, State of New Jersey, and Chairman of the study group represented the Conference at a hearing on the NBS Organic Act that was scheduled by the Subcommittee on Science, Research, and Technology of the U.S. House of Representatives. Mr. Sydney Andrews, State of Florida, and Mr. Ken Hammer, Scale Manufacturers Association also gave testimony at the hearing.

The testimony by NCWM members stressed the measurement needs of the States and of industry, and detailed their concerns regarding the lack of adequate support and services provided by the National Bureau of Standards. Specific recommendations and amendments to the Act were offered.

Primarily, the testimony by NCWM members recommended changes to the NBS Organic Act that would mandate NBS to provide services to the States through its Office of Weights and Measures and to serve as sponsor of the National Conference on Weights and Measures. It was also recommended that the composition of the Visiting Committee (which reviews the NBS program) be changed to require that two of its members be from the State regulatory community.

Mr. Stadolnik, NCWM Chairman, has called upon the State and local weights and measures officials and Associate Members of the Conference to send in comments to the subcommittee regarding this matter and to make their representatives in the U.S. Congress aware of their concerns.

During the open hearing of the NCWM Policy and Coordination Committee, Mr. Daryl Tonini, Scale Manufacturers Association (SMA), recommended that the study group give priority to its consideration of the Legal Metrology Control System as proposed by SMA.

(Item 102 was adopted)

103

TASK FORCE ON NATIONAL TYPE APPROVAL

The Task Force on National Type Approval met on January 14, 1981.

NBS-CALIFORNIA RECIPROCITY

The NBS Office of Weights and Measures (OWM) has issued Reports of Tests on the following equipment based upon tests performed by California officials:

	<u>Number</u>
Small-capacity scales	3
Platform scales	1
Point-of-sale systems	4
Large-capacity scales	1 (in progress)
Indicating elements/printers	2 (in progress)

California has issued Type Approval certificates based upon OWM Reports of Test for the following devices:

	<u>Number</u>
Small-capacity scales	3
Point-of-sale systems	4
Indicating elements/printers	6

The OWM is currently reviewing the California test results for four platform scales and four indicating elements/printers prior to issuance of NBS Reports of Test.

California has type approved 87 scales in 1980. California also reported that under their program 31 load receiving elements, electronic digital weight indicators, and point-of-sale systems were subjected to permanence testing or field verification last year. Seventeen of these

systems failed the permanence tests. The results indicate a need for a permanence test. A brief summary of the conditions that resulted in device failure of the permanence test was provided by California. The test results will be reviewed in detail when the permanence test is discussed at a future meeting.

California is in the process of defining a "one-of-a-kind" device which will receive special consideration in the type approval process. They are also drafting a paper that will define to what extent a device can be modified before it will require a new type approval examination. California will request comments from industry on this information after the drafts have been developed.

FGIS PROGRAM

The Federal Grain Inspection Service (FGIS) reported that they are continuing to evaluate scales and weighing systems for type approval as required under the Federal law. Their examination consists of two parts:

- 1) a laboratory evaluation of an instrument to determine compliance with the FGIS checklist, and
- 2) performance tests conducted in the field to test the overall operation of the system. A design evaluation is not done on the instrument in the field since this test is performed in the laboratory.

Additionally they are conducting type approval examinations on scales and weighing systems that were in use at the time FGIS was created but which had never been subjected to a type approval examination. These are devices which continue to be used under the "grandfather clause" in their regulations. Eventually all of these systems will be type examined. The work required to establish type approval reciprocity between FGIS and NBS is in the final stages. The last phase of this process requires the joint examination of equipment for compliance with the type approval criteria of each agency.

CANADIAN ACTIVITIES

Mr. John Armstrong, Chief of the Weights and Measures Division in Canada, gave a presentation on the Canadian type approval program. He described the program operation and workload along with a summary of the results of the examinations.

Mr. Armstrong also discussed his proposal to explore the possibility of reciprocity between Canada and the United States in the area of performance tests for type approval. For this purpose an

investigation is being undertaken to identify the degree of duplication in type approval examinations by the two countries. He is also pursuing this possibility with Australia and the United Kingdom.

NATIONAL TYPE APPROVAL PLAN (NTAP)

Mr. Albert Tholen, Chief of the Office of Weights and Measures, gave a presentation on the papers "The Impact of Technology on European Weighing Machine Industries," by G. F. Hodsman of Great Britain, and "Introduction to the International Electrotechnical Commission's Quality Assessment System for Electric Components." Both papers contain information that is important and relevant to the effort of attempting to establish a national type approval program in the United States.

The draft type approval criteria and test procedures prepared for the Task Force on National Type Approval were distributed in late December, 1980, with comments to be submitted by April 15, 1981 to Henry Oppermann of the Office of Weights and Measures.

REORGANIZATION OF TASK FORCE

During the meeting of the Task Force, several problems existing in the operation of type approval programs were discussed along with issues which must be addressed to progress toward the establishment of a national type approval program. The issues divided into two general categories--administrative and technical. To enable the Task Force to deal with these areas more effectively and to promote activity within the Task Force, the Task Force is being divided into a policy and a technical working group with Mr. Ezio Delfino (California) remaining as chairman of the task force. Mr. George Mattimoe (Deputy Director of Measurement Standards, Hawaii) has been asked to chair the Policy Working Group; Mr. Harry E. Lockery (President, Hottinger Baldwin Measurements, Inc.) has been asked to chair the Technical Working Group.

1. Policy Working Group

The Policy Working Group will undertake matters related to developing, organizing, and administering a national type approval program. Examples of the types of issues to be addressed by this group are:

- a. Should the type approval program be developed to address only the needs of type approval in the United States or should it be directed toward satisfying OIML/international considerations?
- b. Who should conduct type approval examinations? Some possibilities are:

- 1) A few select State/Federal labs
 - 2) A single Federal lab
 - 3) Private laboratories
 - 4) Self-certifying industry labs.
- c. Explore means to get all States and Federal agencies to accept the results of one type approval examination nationally. This might include a review of Federal and State laws and recommending changes with respect to type approval.
 - d. Establish a time frame for bringing a proposed type approval program to the NCWM for consideration.
 - e. Establish the resources and qualifications needed by a laboratory to enable them to perform type approval examinations and establishing a mechanism whereby uniformity is maintained between laboratories.

2. Technical Working Group

The Technical Working Group will undertake the review, revision, and development of type approval checklists and procedures. They may also develop drafts of new checklists for devices that have not been addressed in existing checklists.

Under the technical group there are likely to be subgroups to address the checklists and procedures applicable to particular types of devices such as scales, retail fuel dispensers, vehicle tank meters, taximeters, fabric measuring devices, etc. Examples of issues that may be addressed by the technical group are:

- a. Motion detection test procedure;
- b. Procedure to determine money value agreement on analog computing registers for gasoline dispensers, particularly for high unit prices;
- c. Application of a permanence test-tolerance;
- d. Defining what constitutes a "type" of device;
- e. Position tests and tolerances.

Anyone interested in participating in the working groups of the task force should contact Ezio Delfino of the California Division of Measurement Standards.

The Task Force and its subgroups held several meetings during the Conference and the results of these and future meetings will be communicated to Conference members.

(Item 103 was adopted)

104

REPORT ON THE UNITED STATES METRIC BOARD

The committee was pleased to have Mr. Sydney D. Andrews, Director, Division of Standards, State of Florida, and NCWM Representative on the United States Metric Board, attend the committee sessions and provide valuable input on metric matters. A summary of his report on the plans and progress of the U.S. Metric Board presented at the interim meetings follows.

The United States Metric Board (USMB) continues to hold meetings bimonthly at different cities around the country. The format remains essentially the same with committee meetings on the first day followed by two days of business sessions. The morning of the second day is reserved for a public forum as the Board continues its desire for citizen input. I regret to report that attendance by the public has ranged from fair to poor; however, media coverage has been extensive so it is felt that public awareness has been increased through these meetings.

During the past year the Board has reorganized its committee structure to streamline its operation. There are fewer main committees, with subcommittees, ad hoc committees, and task forces assigned to carry out specific responsibilities. The terms of five members who were appointed for two years have expired. Three have been reappointed, but the other two slots remain vacant. Also, one member has resigned and has not been replaced, so we are not up to full strength.

In further pursuit of the resolution from the 64th National Conference on Weights and Measures requesting the Board to take the initiative in removing legal barriers to metrication, the General Counsel of the Board has continued to work with the Counsels from the Federal Trade Commission, Food and Drug Administration, and other governmental agencies to get advisory opinions on their rules pertaining to metric labeling and sizing. A copy of these opinions is available from the USMB office. The consensus of these Counsels is that there are no legal barriers to metrication; however, their interpretations present such a morass of problems that even they concede there are "legal impediments." I still feel there are legal barriers that should be either removed or challenged, especially in the Fair Packaging and Labeling Act. This matter is still being studied by the Counsels from the various agencies concerned.

The Board continues to follow up on our public hearings of fuel dispensers conducted in May 1979. A progress report is published periodically, and now shows more than 10 percent of the dispensers in

this country are selling motor fuel by the liter with the number increasing monthly. Many small marketers have chosen this option as an economic alternative to converting dispensers to compute at over 99.9 cents per gallon. Also, several major marketers have made a commitment to convert their dispensers to a metric mode, and others are still giving it serious consideration. The Board has produced camera-ready copy which can be used by marketers to inform their customers about the switch to metric, and give them needed information regarding the relationships between a gallon and a liter, as well as between miles per gallon and miles per liter. This material is available free of charge. Also, on this subject, the Board has developed audio tapes for distribution to radio stations and video tapes for distribution to television stations. Both have proved very popular as evidenced by numerous requests from them. Some of the video tapes have even been shown in prime time spots.

General information on metrication is being offered by the Board through a "Metric Magazine" which are 4.5 minute audio tapes distributed weekly to 554 radio stations. These usually feature a member of the Board discussing a subject in which he or she has a special interest or expertise.

On September 23-25, 1980, in Nashville, Tennessee, the Board sponsored the first nationwide meeting of the State Metric Coordinators. The Governor of each State was requested to designate someone from an existing State Metric Council or Committee, or in those States where no such organization existed they were asked to appoint a delegate to attend this meeting. The response was very good with more than half the States represented. I was especially pleased to see so many weights and measures officials representing their States as the Metric Coordinators. At this meeting the National Council on State Metrication was formed under the sponsorship of the USMB. This will serve as the liaison organization between the Board and the metric agencies of the various States. An annual meeting is planned, with liaison maintained during the interim by correspondence and other forms of communication. The next meeting is tentatively scheduled for Des Moines, Iowa, in June of 1981. I urge all State weights and measures officials whose States were not represented at the first meeting to contact their Governors at an early date and urge each of them to either appoint a State Metric Council or recommend to the State legislatures that such a Council be authorized by an appropriate Act; all States should be represented at future meetings. The proceedings of the first meeting will be published in the near future, and I have requested that each State Director of Weights and Measures be sent a copy.

On December 2-3, 1980, the USMB joined with the National Institute of Building Science, and others, in sponsoring a seminar on metrication in the construction industry. This industry, which is made up of many trades and crafts, with limited international involvement, seems to have little incentive to switch to metric. However, there does appear to be some interest, and the purpose of the seminar was to explore the possibilities. Participation was good, and a report will be rendered in the near future.

Private sector planning guidelines have been developed and approved by the Board and copies are now available. These should be useful to any business contemplating conversion of its activities to the metric system. Also, the Board has published a book entitled "Antitrust--A Handbook for Metric Planning and Conversion." This document was prepared by our Office of General Counsel in conjunction with the Antitrust Division of the Department of Justice and the Bureau of Competition of the Federal Trade Commission. It offers to Private Sector metric planners a guide to the antitrust implications of the metrication process. The book is free on request from the Board office.

Contracts have been let for several studies regarding metrication that are now under way. The Workers Tool Survey is designed to provide information on the impact metrication has on workers who must buy metric tools in addition to their regular tools. A survey is also being conducted on the impact on small businesses, and on their plans to convert. A similar study is being made on the "Fortune 1000 Companies" to learn more of their plans and the effects of metrication on large business corporations. A case study is being made of the conversion to metric containers by the wine and distilled spirits industries. We hope to learn how to help others avoid some of the mistakes made by those industries, which resulted in large segment of the public feeling they had been deceived or misled during the period of transition.

From its inception the Board has placed great emphasis on concerns of the consumer. This concern will receive even greater emphasis in the future for the Board will soon add to its staff an expert in the field of consumer relations to serve as Director of Consumer Affairs. One of the major responsibilities of this person will be to alert the Board to any metric activity in which the consumer is not being properly considered, and to identify those metrication plans in which consumers need to be involved in order that they may provide input early in the process.

The Second Annual Report of the Board will be published soon, and once again I will request that a copy be sent to each State Weights and Measures Director. Anyone else wishing a copy should request it from the Board Office. The report last year was mainly pictorial with emphasis on showing what metrication has occurred. This year the report will contain much more information about the Board's activities as well as information about the progress of metrication in our country.

Our budget for the fiscal year 1981 was approved for 2.708 million dollars with 31 full-time positions. This is rather meager by Federal standards, and will not allow for much growth. However, we are getting more involved in research, public awareness and education programs, and case studies that will make it possible for us to assist those who look to the Board for help. In January of 1981 the

Board Office moved to permanent quarters. The new address is: United States Metric Board, 1600 Wilson Boulevard, Fourth Floor, Arlington, Virginia 22209.

Mr. Andrews, Director, Division of Standards, State of Florida, and NCWM representative on the U.S. Metric Board, provided an updated report on activities of the Board since the Interim Meeting Report was prepared. Such information and further details on current activities of the U.S. Metric Board will be distributed through the Board's Office of Information.

(Item 104 was adopted)

105

REPORT ON THE INTERNATIONAL ORGANIZATION OF
LEGAL METROLOGY

The following OIML highlights, with the exception of the first one, which discusses the 6th International Conference of Legal Metrology, are coordinated with parallel activities within the various National Conference Standing Committees.

1. USA Participation in the 6th International Conference of Legal Metrology

The 6th International Conference of Legal Metrology was held June 16-20, 1980 in Washington, D.C. with the United States as host Government. Of the 46 member nations of OIML, 34 sent delegations. Three corresponding member nations and 14 international organizations were represented by observers. Additionally, Canada and the People's Republic of China, who are in the process of joining OIML, sent delegations to observe. The United States delegation consisted of:

Dr. Edward I. Brady, NBS, Head of Delegation
Dr. Arthur O. McCoubrey, NBS, USA Representative to OIML
Mr. Charles H. Vincent, Chairman, NCWM
Mr. Daryl Tonini, Technical Director, SMA
Mr. David E. Edgerly, NBS, Advisor to Delegation
Mr. Frank Lancetti, Department of State, Advisor to Delegation

The following State weights and measures officials were also in attendance during the Conference: Syd Andrews (Florida), Jim Bird (New Jersey), Darrell Guensler (California), Jim Lyles (Virginia), and Dick Thompson and Lacy DeGrange (Maryland).

From a business standpoint, the Conference reached agreement on all of the major points of its agenda. The following International Recommendations of interest to the weights and measures community were approved during the Conference:

- o Continuous totalizing weighing machines (Belt Conveyor Scales)

- o Checkweighing and weight grading machines
- o Hexagonal weights, ordinary accuracy class, from 100 g to 20 kg
- o Speedometers, mechanical odometers, and chronotachygraphs for automobiles
- o IR5 Revised - Meters for liquids other than water (Positive Displacement Meters)
- o Measuring systems for liquids other than water - general provisions
- o IR28 Revised - Technical regulations for non-automatic weighing machines.

The International Bureau of Legal Metrology (BIML), as secretariat of the Conference, and the various member nation delegates, seemed very well pleased with the physical arrangements and with the social amenities provided by the United States as host country. A large number of the OIML delegates remained in Washington to attend the 65th National Conference on Weights and Measures.

2. OIML Activities of Interest to the NCWM Committee on National Measurement Policy and Coordination

- 2.1 OIML International Certification System. In May 1980, Dave Edgerly and Al Tholen of NBS represented the United States at a meeting of the OIML Working Group considering the development of an international system that would permit member nations to certify measuring instruments as meeting applicable OIML International Recommendations. The results of this meeting were reported to the International Committee of Legal Metrology during its June 1980 meeting in Washington. Work on the formation of the certification system will continue and it is expected that by March 1982 there will be a draft set of principles for operation of the system. These proposed principles will be considered by the International Committee during its next meeting. NBS will continue to participate in this work.
- 2.2 OIML PS22, RS6 - Principles of Assurance of Metrological Control. The Committee is very much interested in the International Document on principles of assurance of metrological control that is being developed by a U.S. National Working Group under the chairmanship of Dr. Brian Belanger of NBS. A draft of the document is being reviewed and will be covered in detail in future reports by the National Measurement Policy and Coordination Committee.

3. OIML Activities of Interest to the NCWM Committee on Laws and Regulations

Package Sampling Plan. In July 1980, NBS received a first predraft OIML Recommendation developed by Switzerland on the verification of prepackaged products using statistical techniques. The draft was widely circulated within the United States and a meeting was held at NBS in November 1980 to consider a strategy for a U.S. position on the draft given the pending proposals on net weight within FDA and USDA, and given the proposed revision of NBS Handbook 67. As a result of the November meeting the U.S. informed Switzerland of the pending regulatory action in this country vis-a-vis the USDA and FDA proposals and indicated that detailed technical comments on the Swiss draft would not be forthcoming until after the agencies involved have completed their final proposals on net weight labeling. Carroll Brickenkamp participated in these discussions representing the Laws and Regulations Committee.

4. OIML Activities of Interest to the NCWM Committee on Specifications and Tolerances

- 4.1 Length Measurement. In June 1980, NBS received a third predraft OIML Recommendation developed by France on instruments for measurement of length; namely, instruments used to determine the length of a line, wire, cable, tape, piece of cloth, etc. The Recommendation does not include rigid or flexible length measures such as tape measures or shop rules. Otto Warnlof coordinated the development of a U.S. position which was transmitted to France in November 1980. No response has yet been received from France on the United States' position.
- 4.2 Fluid Measurement. A meeting of Pilot Secretariat 5 - "Measurement of Volume" was held in October 1980 at the PTB in Braunschweig, Federal Republic of Germany. The U.S. delegation was headed by Otto Warnlof and included Darrell Guensler (State of California and member NCWM S & T Committee). The purpose of the meeting was to consider the progress of the 20 Reporting Secretariats under PS5 and to determine priorities of activity over the next several years. Of particular interest to the weights and measures community is the work, just initiated by France, on a draft International Recommendation covering electronics associated with fluid measuring devices. Also considered during the October meeting was a third predraft Recommendation covering measuring systems for liquids other than water with positive displacement meters. Work on this draft will continue during 1981 and no firm schedule has yet been set for international meetings of PS5 or its Reporting Secretariats in 1981.
- 4.3 Mass Measurement. Since June 1980 plans have been progressing within Pilot Secretariat 7 - "Measurement of Mass" for a number of important international meetings in March 1981 in Paris. PS7/RS2--"Electronic Weighing Devices" will hold its first

international meeting March 17-20, 1981, at the BIML Headquarters in Paris to discuss the first predraft Recommendation developed by the United States as secretariat, on electronic weighing devices. Immediately following this meeting the French, as secretariat of PS7/RS4 - "Non-automatic Weighing Instruments" will host a meeting March 23-25, 1981, at the French Ministry of Industry to consider important revisions to International Recommendation 3 - "Metrological Regulations for Non-automatic Weighing Machines." Following this meeting the British, as secretariat of PS7/RS5 - "Automatic Weighing Machines," will host a meeting March 26-27, 1981, at BIML to discuss its draft Recommendation on package filling machines and to consider U.S. proposed revisions to the recently adopted Recommendation on package check-weighing machines. A United States delegation to these meetings is being assembled and will include representation from the National Conference on Weights and Measures.

In October, 1980 the United States, as secretariat of PS7/RS8 - "Load Cells," hosted its second international meeting at the PTB in Braunschweig, FRG to discuss the second draft Recommendation of load cells. David Edgerly (NBS) headed the U.S. delegation and chaired the four days of meetings. Other members of the delegation were John Elengo (Revere Corporation) and Peter Perino (Transducers, Inc.). The meeting was very successful and it is hoped that the load cell draft can soon begin the process of review leading to final adoption by OIML as an International Recommendation.

5. OIML Activities of Interest to the NCWM Committee on Education, Administration, and Consumer Affairs

Teaching of Metrology. In November, 1980 the USSR, as secretariat of PS31 - "Teaching of Metrology," hosted a meeting of the Pilot Secretariat in Tashkent, USSR. The U.S. delegation consisted of Dr. Arthur McCoubrey, U.S. Representative to the International Committee of Legal Metrology, and Dr. Lee Phillips, Assistant Director for Engineering, Texas A & M Extension Service. The purpose of the meeting was to plan a scope of activity and schedule of work for the development of both guidelines on the teaching of metrology and recommendations as to the sharing of teaching programs, course materials, etc., within OIML member nations. This work is of interest to the United States, particularly as regards the current activities with Texas A & M University to develop training programs for weights and measures officials.

6. OIML Activities of Interest to the NCWM Committee on Liaison

Grain Moisture Testing. France, as secretariat of PS18/RS1 - "Meters for Measuring Moisture of Grain and Oleaginous Seeds," circulated its third predraft Recommendation on grain moisture meters requesting comments from the various OIML member nations participating in the work. Dr. Carroll Brickenkamp is coordinating a U.S. position on the

draft and will consult with the NCWM Task Force on Grain Moisture Measurement during the NCWM Interim Meeting. An international meeting on the draft is tentatively scheduled for October 1981 in Paris. The U.S. will send a delegation to this meeting.

7. OIML Activities of General Interest to all NCWM Standing Committees

7.1 Revision of OIML Vocabulary/Establishment of New International Measurement Vocabulary. OIML is currently undergoing a revision of its "Vocabulary of Legal Metrology" (1978 Edition). It is expected that this process will take several years to complete and the United States is actively involved in this work. At the same time, based on an agreement among OIML, the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC), a jointly developed International Measurement Vocabulary is being prepared and will contain commonly used measurement terms of interest to all three organizations. As the first step in this process, a proposed list of terms to be included in the new measurement vocabulary has been circulated within the three organizations. NBS has recently submitted extensive comments on the proposed list of terms to OIML and will continue to actively participate in this work.

7.2 Electronics Associated with Measuring Instruments. The interest in developing uniform international requirements for electronic equipped measuring devices and in developing uniform means for testing such devices to determine conformity to requirements is enormous. In every OIML meeting over the past year this subject has been of principal interest and it is clear that all of the Governments involved are concerned about the possibility that in the absence of uniform international requirements each individual nation will pursue its own requirements with disastrous consequences. Recent discussions with Common Market officials made it clear that the number one priority in the measuring device directives program over the next five years is the development of uniform electronic requirements within the ten-nation European Economic Community. NBS, the weights and measures community, and private industry must continue to work closely in assuring strong U.S. technical level participation in the development of OIML Recommendations covering electronics.

(Item 105 was adopted)

E. H. STADOLNIK, Chairman, NCWM
J. J. BARTFAI, New York, Chairman - L & R Committee
G. L. DELANO, Montana, Chairman - S & T Committee
S. J. DARSEY, Florida, Chairman - Education Committee
E. C. HEFFRON, Michigan, Chairman - Liaison Committee
H. F. WOLLIN, NBS, Executive Secretary - NCWM

Committee on National Measurement Policy and Coordination

(On motion of the Committee chairman, the report of the Committee on National Measurement Policy and Coordination voting key items 100 through 105 was adopted in its entirety by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the executive secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

VOTING RESULTS--Committee on National Measurement Policy
and Coordination

Voting Key	House of State Representatives		House of Delegates	
	Yes	No	Yes	No
101	42	0	59	0
102	40	0	61	1
{ 103	44	0	60	0
{ 104				
{ 105				



REPORT OF THE COMMITTEE ON
LAWS AND REGULATIONS

Presented by JOHN J. BARTFAI, Director,
Bureau of Weights and Measures, Department
of Agriculture and Markets, Albany, New York

VOTING KEY

200

INTRODUCTION

The Committee on Laws and Regulations presents its report to the 66th National Conference on Weights and Measures. This report consists of the interim report as printed in the Conference Announcement and amended by the final report. The report represents recommendations of the Committee to the Conference and are based on written and oral comments received during the year and oral presentations made during the open meeting of the Committee.

All section references are to National Bureau of Standards Handbook 130, 1980 Edition, "Model State Laws and Regulations" (H-130).

201

MODEL STATE WEIGHTS AND MEASURES LAW

201-1 ADOPTION BY CITATION

Although the NCWM voted in June 1980 to drop the issue of adoption of H-130 by citation, the Western Weights and Measures Association in September requested the Conference to study this issue. The Chairman of the Laws and Regulations Committee asked Mr. Allan Farrar, National Bureau of Standards Legal Counsel, to chair a study group to explore the possibilities of developing a workable method whereby the several States could adopt by citation the regulations contained in H-130. Subsequently, Mr. Farrar invited two other attorneys to serve on the study group, representing industry (Mr. Neal D. Peterson, General Mills, Inc.) and State Government (Mr. Neil D. Magnus, Deputy Attorney General, NJ).

The study group met February 6, 1981 at the National Bureau of Standards (NBS), Gaithersburg, Maryland. The study group decided that a survey was needed to ascertain the different administrative and legal procedures currently used by the States to adopt Handbook 44 and the model regulations in Handbook 130, and the frequency of updating such codes and regulations.

A survey questionnaire was constructed and mailed to the States on March 9, 1981. Although prompt response was requested by June 1981, only 33 of 50 States had responded to the Chairman. Before the survey is analyzed follow-up request will be made to the 17 States that did not respond. The contents of the letter and questionnaire is included at the end of this item as part of the Committee's report.

The Committee also was sent a status report on the adoption of the Model State Packaging and Labeling Regulation, H-130, by the State of California.

The Committee will continue to carry this item on its agenda for further work in the coming year.

SURVEY QUESTIONNAIRE

As Chairman of the Committee on Laws and Regulations of the National Conference on Weights and Measures, I seek your assistance in obtaining certain information from the Attorney General of your State that the Committee feels is needed to bring about the uniform adoption by the several States of the model regulations set out in NBS Handbook 130, "Model State Laws and Regulations." In support of this request, I believe the following information may be helpful to you and to the other State Directors of Weights and Measures to whom this letter is being sent.

As you may recall from the report of our Committee at last year's Conference, adoption by citation has been a feature of the process by which NBS Handbook 44, "Specifications, Tolerances, and other Technical Requirements for Weights and Measuring Devices," has achieved wide acceptance (i.e., adopted into law or regulation by the States). The Committee is of the view that a similar mechanism should be available for adoption of the model regulations in NBS Handbook 130 which the Conference has previously recommended to the States for adoption. I wish to make clear that the Committee is not recommending that your State adopt NBS Handbook 130 in its entirety as the Handbook contains model State laws, guidelines, and other material which are not intended to be promulgated as regulations.

The achievement of this objective is viewed as largely a legal matter. Accordingly, I have established a small task force of three lawyers to assist the Committee in developing a workable method whereby a State could adopt the mentioned model regulations. The lawyers are Allen J. Farrar, NBS Legal Adviser; Neil D. Magnus, Deputy Attorney General, Division of Law and Public Safety, New Jersey; and Neal D. Peterson, Attorney for General Mills, Inc. Thus, the interests of the Federal Government, State governments, and private sectors are represented on the task force.

Although, as indicated above, the adoption by citation of NBS Handbook 44 has achieved wide acceptance by the several States, a potentially serious legal problem may exist. A State statute may lawfully adopt, and a State Director of Weights and Measures may then enforce, the provisions of NBS Handbook 44 (or indeed of any NBS handbook or model regulation recommended for adoption by the Conference). However, there is a sound legal basis for believing that a State statute that also incorporates or adopts by citation future amendments or changes to that handbook (or any NBS handbook or model regulation) could be successfully challenged in court if the State Director of Weights and Measures or other appropriate official tried to enforce compliance with any amendment or revision of the handbook that was made subsequent to the date of the statute adopting the initial version of the handbook. The legal basis that might be asserted in support of such challenge is that the adoption by reference in a State statute of an amendment to a handbook or a revised edition thereof that did not

exist on the date the State adopted the handbook was an unconstitutional delegation of legislative power.

Therefore, to guard against the possibility of such challenge and to assure the prompt and effective enforcement of future amendments or revisions to NBS handbooks or model regulations that the Conference recommends for adoption by the States, I need your assistance and cooperation in obtaining certain information. The type of information desired is set out in the enclosed questionnaire. As may be seen, the enclosure lists several questions to be answered and certain material to be supplied. Your office may well be able to supply some of the information. It is believed, however, that the office of the Attorney General of your State can be of great assistance in enabling you to respond fully to this request.

In order that the task force can study the information called for herein and enable the Committee to present a report on our efforts in this regard at the Conference in St. Louis next July, I respectfully request that the desired information be furnished to me, at the address on the questionnaire, within 30 days of the date of your receipt of this letter. Please be assured that there will be ample opportunity at the upcoming Conference and thereafter for full discussion and review of any proposal that may be submitted by the Committee to the Conference.

I am confident that a lawful and workable mechanism to deal with this problem on a uniform basis can be developed by the Committee. Indeed, such a mechanism may already be in place in some States. With your assistance and that of your Attorney General, this is exactly what the Committee, as aided by its task force, proposes to do.

Sincerely,

John J. Bartfai
Director

Return to:
John J. Bartfai, Director
Bureau of Weights and Measures
Building 7A, State Campus
Albany, NY 12235

QUESTIONNAIRE

1. (a) How does your State adopt revisions of NBS Handbook 44?
by statute?
by regulation?
by statute and implementing regulation?
Other (e.g., administrative rule)? If so, describe.
- (b) How does your State adopt revisions to the model regulations in NBS Handbook 130?
by statute?
by regulation?
by statute and implementing regulation?
Other (e.g., administrative rule)? If so, describe.

Please provide a copy of the relevant statute, regulation, and/or rule applicable to 1(a) and 1(b).

2. In order to adopt NBS Handbook 44 and any model regulation in NBS Handbook 130, does the procedural law of your State require:
 - (a) NBS Handbook 44
Public hearings?
Public notice?
Both hearings and notice?
Any requirements other than hearings and notice? If so, describe.
 - (b) Model Regulation in NBS Handbook 130
Public hearings?
Public notice?

Both hearings and notice?

Any requirements other than hearings and notice? If so, describe.

Please include a copy of the relevant procedural law applicable to each of the two items (i.e., Handbook 44 and Handbook 130). If the same procedural law is applicable to both items, one copy is sufficient.

3. What is the frequency in your State of adopting revisions of NBS Handbook 44 and of the model regulations in NBS Handbook 130 following recommendations of such adoption by the National Conference on Weights and Measures?

(a) NBS Handbook 44

Yearly?

Other than yearly? If so, how often?

(b) NBS Handbook 130

Yearly?

Other than yearly? If so, how often?

4. Which version (year) of the model regulations in NBS Handbook 130 has your State adopted?

<u>Model Regulations</u>	<u>Year</u>
Packaging and Labeling	_____
Method of Sale of Commodities	_____
Unit Pricing	_____
Registration of Servicepersons and Agencies	_____
Open Dating	_____

5. Would your State consider adopting those model regulations that you deem appropriate in NBS Handbook 130 as guidelines or intact as written?

	(1)	(2)	(3)
<u>Model Regulations</u>	<u>Guidelines</u>	<u>Intact as Written</u>	<u>Neither</u>
Packaging and Labeling	_____	_____	_____
Method of Sale of Commodities	_____	_____	_____
Unit Pricing	_____	_____	_____
Registration of Servicepersons and Agencies	_____	_____	_____
Open Dating	_____	_____	_____

If column 3 is checked, please indicate your reasons on a separate sheet.

6. How are Federal regulations and subsequent revisions thereof adopted in your State (i.e., regulations appearing in the Code of Federal Regulations)?

by statute?

by regulation?

by statute and implementing regulation?

Other (e.g., administrative rule)? If so, describe.

Bear in mind that NBS Handbook 44 and the model regulations in NBS Handbook 130 are not Federal regulations. NBS Handbook 44 and the model regulations in NBS Handbook 130 are recommendations adopted by the National Conference on Weights and Measures for adoption by the States and are then published by NBS.

Please feel free to add whatever comments you deem appropriate as helpful in responding to the above questions. If more space is required for your answers, please use additional sheets as appropriate. If the meaning of a question is not clear, please call me. My telephone number is (518) 457-3452.

(Item 201-1 was adopted)

201-2 DEFINITION OF "CORD"

The Model State Weights and Measures Law states in part: "The definitions of basic units of weight and measure, the tables of weights and measures, and weights and measures equivalents as published by the National Bureau of Standards are recognized and shall govern weighing and measuring equipment and transactions in the State." NBS Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices," (H-44) sections 1.12. and 1.13. reprints pertinent portions of NBS Letter Circular 1035, one line of which reads:

"1 cord (cd) (firewood) 128 cubic feet."

In the Lakes States area, pulpwood buyers buy on the basis of a cord that is defined as 4 ft by 4 ft by 100 inches (133.33 cubic feet). The Northwestern Weights and Measures Association proposes the definition of the cord be broadened to include pulpwood. The Laws and Regulations Committee of the NCWM has requested the Office of Weights and Measures by memorandum to update Letter Circular 1035 dated January 1960 because it is referenced in H-44 and to address the inclusion of pulpwood in the definition of a cord. The Committee considered placing the issue of whether to recommend a method of sale for pulpwood (if sold by cord) on the 1982 agenda and solicited the opinions of the American Pulpwood Association and other interested parties by letter.

Only negative comments to the Committee's interim report were received both from W & M officials and industry representatives. Therefore, the Committee recommends dropping this item from its report.

(Item 201-2 was adopted.)

202 MODEL STATE PACKAGING AND LABELING REGULATION (MSPLR)

202-1 SECTION 6.13. CHARACTER OF DECLARATION: AVERAGE

Although Section 12.1.1. of the Model State Packaging and Labeling Regulation (MSPLR) states the principle of the average requirement for packaged goods, only one of the two parallel sections on labeling (Section 6 on consumer packages and Section 7 on nonconsumer packages), iterates the average concept. Section 7.6 reads:

7.6. CHARACTER OF DECLARATION: AVERAGE.--The average quantity of contents in the packages of a particular lot, shipment, or delivery shall at least equal the declared quantity, and no unreasonable shortage in any package shall be permitted, even though overages in other packages in the same shipment, delivery, or lot compensate for such shortage.

The Committee recommends the addition of this statement to the parallel section (Section 6) on consumer packages:

6.13. CHARACTER OF DECLARATION: AVERAGE.--The average quantity of contents in the packages of a particular lot, shipment, or delivery shall at least equal the declared quantity, and no unreasonable shortage in any package shall be permitted, even though overages in other packages in the same shipment, delivery, or lot compensate for such shortage.

(Item 202-1 was adopted.)

202-2 SECTIONS 7.6. and 12.1. REFERENCES TO "LOT, SHIPMENT, OR DELIVERY"

The Committee heard a petition from the California Brewers Association to define a lot as

"a selection of containers under one roof produced by a single company of the same size, type, and style, manufactured or packed under similar conditions with a minimum number to be equivalent to one production line shift."

The intention of the petition is to focus Weights and Measures enforcement on production lots as opposed to small collections of packages on retail shelves, because the production lot is under the control of the packager.

An alternative proposal was made that would require mingling of lot and date codes in package inspection at warehouse locations.

The Committee has reviewed the proposals in light of Sections 7.6. and 12.1. of the MSPLR which refers to "shipment, delivery, or lot." If the petition is approved, the terms "shipment" and "delivery" would have to be dropped from this regulation.

The Committee recognizes the inherent value of in-plant and warehouse inspection and is of the opinion that, wherever possible, such inspections should be carried out. At the same time the Committee recognizes the need for the State and local weights and measures officials to protect the consumer at the level where the ultimate sale is made. The Committee therefore recommends no change to the MSPLR.

The Committee looks forward to the work of the Special Study Group on Enforcement Uniformity of the NCWM which will be exploring the mechanisms that might be instituted to make in-plant inspection workable.

(Item 202-2 was adopted.)

202-3 SECTION X.XX. NONWOVEN SYNTHETIC SCOURING PADS

The Committee heard testimony from the 3M Company requesting individual package variations from declared dimensions for nonwoven synthetic scouring pads (while still meeting the average requirement) similar to those variations granted textiles in Section 10.9.3. of the MSPLR.

The reasons for this request include the facts that the pads are not dimensionally stable when cut and the cutting equipment is subjected to extremely high wear.

The Committee recommended and the 3M Company has provided data on its own and competitors' products to provide a basis for information on what individual package variations should be applied to this product. The NBS support staff have not yet analyzed that data and the Committee makes no recommendation at this time. This agenda item will be carried over.

(Item 202-3 was adopted.)

202-4 METRIC LABELING PROVISIONS

It was brought to the attention of the Committee that the metric labeling provisions in the model regulation may create conflicts between State and Federal requirements since the model regulation applicable to metric labeling includes type, size, and location requirements while Federal regulations may not include such type, size, and location requirements on metric labeling. At the request of the Laws and Regulations Committee, the Liaison Committee has transmitted a letter to FDA, FTC, and USDA to determine if any conflicts exist between Federal requirements and the metric labeling provisions in the Model Regulation. Only one formal response has been received; therefore, the Committee will carry this item over.

(Item 202-4 was adopted.)

203 MODEL STATE METHOD OF SALE OF COMMODITIES REGULATION (MSMSCR)

203-1 SECTION 1.3. BUTTER, OLEOMARGARINE, AND MARGARINE

The American Butter Institute and the National Association of Margarine Manufacturers have proposed to omit the 500 g size from Section 1.3(b) for butter and margarine and replace it with a 450 g size in order to permit an easy and acceptable conversion to metric sizes for consumer packages in these industries. They argue that 500 g is rather large for consumer usage, it is not universal in other countries using metric, and it would entail heavy conversion costs to the industry.

However, the Committee's position is that the metric sizes recommended in Section 1.3(b) permit a smaller 250 g size if 500 g is deemed too large by the consumer; that a 450 g size would merely be a renaming of the pound size; and that a 450 g size would look identical to the pound size to a consumer and would not permit a visual value comparison. As to the heavy conversion costs required to go to 500 g, the Committee reiterates its position that the metric sizes in the Model State Method of Sale of Commodities Regulation (MSMSCR) are provided for those who wish voluntarily to go to metric sizes. No organization or agency requires metric sizes. Much of the conversion cost (if conversion to metric is desired) could be incurred as normal machinery replacement

costs when packaging machinery wears out. Therefore, the Committee recommends no change to Section 1.3(b) of the MSMSCR. (See item 203-7 for date change proposal).

(Item 203-1 was adopted.)

203-2 SECTION 1.12 CEREAL GRAINS AND OIL SEEDS

A letter from the Oklahoma Grain and Feed Association was forwarded to the Committee asking whether the addition of water to grain is legal. The request was prompted by an article reporting on methods of adding water to grain to bring the moisture content up to market standards. For example, when soybeans are sold at 8% moisture content, there is less weight sold (and less revenue for the soybeans to the seller) than if water were added to the same soybeans to bring them to 10% moisture content.

However, the Committee is greatly concerned about the ramifications of such practices. Many grain experts do not believe that overdried grain should be valued as highly as grain at moisture contents close to market standards. Overly dry grain is more susceptible to breakage, for example.

Water added after harvest will not be taken up chemically the way that naturally moist grain binds water. Errors in adding water or the particular biochemical nature of the grain after addition of water can lead to spoiled grain. Studies on the long-term keeping qualities of grain with water added have not been carried out. The calibration of moisture meters is based on naturally moist grain and there is a known difference between the electrical properties of naturally moist grain and grain with moisture added.

Of a more basic nature, however, the Committee recognizes the fact that a grain buyer purchases grain expecting such grain to be naturally moist or dried, not to be with water added. The seller who adds water to grain solely to add weight, therefore, misrepresents his product.

The Committee has been forwarded letters from both the Food and Drug Administration and U.S. Department of Agriculture. Both agencies indicate that the addition of water to grain solely for the purpose of adding weight is an illegal practice. Because existing Federal laws already prohibit this practice, the Committee recommends no further action on the part of the Conference at this time.

(Item 203-2 was adopted.)

203-3 SECTION 3.4. RAILROAD CAR TARE WEIGHTS

A status report on the Association of American Railroads (AAR) Stenciled Lightweight Activity Questionnaire of 1979 was provided to the Committee. According to AAR's figures, restenciling is occurring

at approximately a 6-year cycle, with their goal a 5-year cycle. More detailed analyses of stenciled tare weight activity will be available in the future because timely reporting of these data is now required to be submitted to the AAR UMLER file (a computer-generated data file) and separate surveys will not be necessary.

(Item 203-3 was adopted.)

203-4 SECTION 1.7. OTHER MILK PRODUCTS

General Mills, Inc. on behalf of its subsidiary, Yoplait USA, Inc., has proposed the addition to Section 1.7. of an 18 oz size for yogurt, because it is a whole multiple of Yoplait's 6 oz single serving size container and because it is close to the 500 gram metric container size (18 oz = 510 g) and can be converted to metric without change of container or packaging equipment. Since the metric labeling provisions of the MSMSCR do not go into effect until January 1, 1982, an avoirdupois size (if any) will have to be used until 1982.

Letters from the Milk Industry Foundation and from the Dairy Sector of the American National Metric Council were received by the Committee indicating their support of an 18 oz size to be permitted for yogurt. The Committee, therefore, recommends Section 1.7.(a) be amended to read (that which is to be added is underlined) as follows:

- (a) Inch-Pound Weights - 8, 12, 16, 18, 24, 32, 64, 80, and 128 ounces avoirdupois.

(Item 203-4 was defeated.)

203-5 SECTION 2.15. LIQUIFIED PETROLEUM GAS (LPG) CYLINDER TARE WEIGHTS

The Committee held this item over from last year in order to determine conflicts with the U. S. Department of Transportation (DoT) requirements. These requirements are now known by the Committee to allow a % 1% variation on the stamped tare weights of cylinders (pertinent specifications under 49 CFR K 170-179). The Committee also heard testimony from a representative of the National LP-Gas Association who described the large variations due to the weight of paint. The 0.25 lb variation proposed by the Committee last year would require restamping of the tare weight every time the cylinder is repainted. Many marketers have no facility for restamping and would have to send cylinders to service agents for restamping. This will necessarily increase the price of the product.

For 100 gal cylinders, DoT's requirements of $\pm 1\%$ may result in a maximum of 0.7 lb error, equivalent to about 0.16 gal or about \$0.11 at today's prices. Therefore, the Committee recommends that the Method of Sale of Commodities Regulation be amended as indicated below in order that the requirements for LPG cylinder tare weights be in conformance with DoT requirements, but with greater detail:

Section 2.15. LIQUIFIED PETROLEUM GAS CYLINDER TARE WEIGHTS--
Whenever stamped tare weights on cylinders are employed in the sale of liquified petroleum gas, the following shall apply.

Section 2.15.1. The allowable difference between the actual tare weight and the stamped tare weight for a new or used cylinder shall be one percent of the actual tare weight. The tare weight shall include the weight of the cylinder (including paint), valve, and other permanent attachments. The weight of a protective cap shall not be included in tare or gross weights.

Section 2.15.2. The tare weights of cylinders at a single place of business found to be in error predominantly in a direction favorable to the seller and near the allowable difference limit shall be considered to be not in conformance with these requirements.

(Item 203-5 was adopted.)

203-6 ICE CREAM AND FROZEN DESSERT COMBINATION FOODS

It has been brought to the Committee's attention that the labeling of ice cream and frozen dessert combination foods may not be adequate for consumer information and that current labeling makes net content inspection difficult. The questions as to

- o what provides full consumer information (net weight, fluid volume plus count, or other combination);
- o what the Food and Drug Administration requires or permits; and
- o what widespread practices currently prevail

need exploration. The Committee will hold this item until next year's interim meetings for further input on these questions.

(Item 203-6 was adopted.)

203-7 EXTENSION OF DATE PERMITTING ROUND METRIC SIZES

In June, 1981, the Committee received letters from the Milk Industry Foundation, the Millers' National Federation, the American Butter Institute, and the National Association of Margarine Manufacturers requesting an extension of the effective data in Sections 1.3. (Butter, Oleomargarine, and Margarine), 1.4. (Flour, Corn Meal, and Hominy Grits), 1.6. (Fluid Milk Products), and 1.7. (Other Milk Products), which list round metric sizes. The effective data for round metric sizes is January 1, 1982. The Milk Industry Foundation and Millers' National Federation request an extension to January 1, 1985. Their reasons for requesting the extension rest on the expense of industry-

wide conversion without measurable benefit to consumers or packagers during this period of national economic recovery. Industry-wide conversion to metric sizes may be forced upon them, they contend, if conversion is permitted and any single packager actually converts to round metric sizes.

In addition, the Millers' National Federation's request mentions a survey of their industry which indicated mixed opinions on the adequacy of the metric size schedule; and, the National Association of Margarine Manufacturers' request mentions Section 407 (b) (2) of the Federal Food, Drug, and Cosmetic Act requiring margarine retail weight to be no more than one pound.

Although these requests have come to the Committee out of sequence with the normal work flow, the Committee recognizes the significance of Conference action before January 1, 1982 on these requests. In order to permit more careful study of this issue by the individual States and by the Committee at the next interim meetings in January, 1982, the Committee recommends an extension from January 1, 1982 to January 1, 1983 of all the round metric size provisions in the Model State Regulation for the Method of Sale of Commodities. This recommendation covers metric size provisions in Section 1.1., 1.2., 1.3., 1.4., 1.6., and 1.7.

(Item 203-7 was defeated.)

204

GUIDELINES AND INTERPRETATIONS

204-1 CATALYST BEADS

A communication from the General Motors Corporation AC Spark Plug Division was forwarded to the Committee which proposes discontinuing the labeling of their catalyst beads by weight. When the catalyst becomes contaminated by leaded gasoline or prolonged use, the catalytic converter in the exhaust system of recent GM cars and trucks (running on unleaded gasoline) must be emptied of its catalyst beads and be refilled by volume with replacement catalyst beads in order to meet emission standards. The beads are used by volume (to fill a catalytic converter), are hygroscopic, and vary in core material density. Therefore, packages of beads meeting a net weight label require an additional one-third pound (on the average) over the packages labeled by volume, cost about \$7.50 more per package, and the additional weight of beads will be discarded in actual use.

It is the opinion of the Committee that the proper method of sale of catalyst beads is by volume, and that it would be appropriate for the quantity declaration to be supplemented by part number or other description of the specific converter for which the package of catalyst beads is intended.

(Item 204-1 was adopted.)

204-2 FLEXIBLE ROPE CAULK

Flexible rope caulk is a product applied by hand but used for the same general purposes as caulking compounds applied with a caulking gun. Section 2.7. of the Model State Method of Sale of Commodities reads:

"SEALANTS.--Caulking Compounds, glazing compounds, and putty shall be sold in terms of liquid measure."

The Federal Trade Commission (FTC), however, has determined that rope caulk may be labeled by net weight. Therefore, the Committee, in order to conform to FTC guidelines, recommends this product be labeled by net weight.

A motion was made and seconded to amend this item as follows (added wording is underlined):

Amend Section 2.7. of the Model State Method of Sale of Commodities to read:

Sealants.--Caulking Compounds, glazing compounds, and putty shall be sold in terms of liquid measure except that rope caulk shall be sold by weight.

(Item 204-2 as amended was adopted.)

204-3 NATIONAL CONFERENCE ON WEIGHTS AND MEASURES POLICY AND GUIDELINES

The Committee recommends deleting that section entitled "Guidelines and Interpretations" from Handbook 130. The Committee proposes a new publication to include policy and guidelines issued by the Laws and Regulations Committee, the Committee on National Measurement Policy and Coordination, and other NCWM Committees as they so choose. The new publication would be "National Conference on Weights and Measures Policy and Guidelines." A section on packaging and labeling guidelines would become a part of this publication.

(Item 204-3 was adopted.)

204-4 POLICY AND GUIDELINES ON METRIC CONVERSION OF RETAIL MOTOR-FUEL DEVICES (GAS PUMPS)

The NCWM voting membership referred this item from the Policy and Coordination Committee to this Committee because of its relationship to regulations being promulgated by the States at the present time. Because they are intended as interim measures to facilitate the conversion to metric, the Committee believes that the following principles and policy should remain in the form of policy and guidelines rather than model regulations.

POLICY ON THE COMPUTATION AND POSTING OF PRICES OF MOTOR
FUELS SOLD BY THE GALLON OR THE LITER AT RETAIL OUTLETS

The sale and purchase of motor fuel by the liter will be one of the first major exposures consumers will have to metric measurement in the marketplace. How well consumers accept the conversion program will depend on their understanding of the change and the information that is made available to them that enables value comparisons among alternative products, comparison of miles per liter with miles per gallon, and comparison of prices per liter and per gallon.

The National Conference on Weights and Measures, in furtherance of its support of Public Law 94-168, "Metric Conversion Act of 1975," offers the following Conference Guidelines as an aid in planning and coordinating the increasing use of the metric system in the United States.

The National Conference on Weights and Measures recommends that each State, county, and city in the United States adhere to the following information and guidelines and that the petroleum industry follow these guidelines in the interest of consumer understanding and nationwide uniformity. This policy amends that of 1979 which recommended price posting by gallon or by the liter.

This policy takes into account the Consumer Liaison Committee of the American National Metric Council (ANMC) paper "Factoring the Consumer into Motor Fuel Dispenser Conversion Programs," the plan on metric conversion developed by ANMC Petroleum and Natural Gas Sector Committee, and the input of most major oil companies.

PRICE POSTING

1. Street Signs -

- (a) Until such time as the sale of gasoline and other motor fuels is predominately by metric measurement (liter), price per gallon information should be made readily available to all prospective customers.
- (b) All street, roadside, and similar advertising signs displaying product price should provide price per gallon information.
- (c) Signs showing the equivalent price per liter may also be used, but their use is optional and should not employ numerals larger than the equivalent gallon price display.
- (d) Signs should show complete dollar and cents numerals and they should be clearly legible and of full size.

An exception should be granted to street signs that were designed to display only three numerals (e.g., \$0.899) and not four numerals as required for prices over \$1.00 per gallon (e.g., \$1.259). Until such signs can be replaced or modified, it would be acceptable (a) to attach an appropriate sign extension with the decimal fraction of a cent representation in alignment with the posted price, (b) to include a smaller fraction of a cent representation with the last numeral of the posted price, or (c) to add the whole number "one" before the cents values.

- (e) The changeover to advertising prices by the liter as a single mode of pricing should be established when 75 percent of all retail outlets in a jurisdiction have converted their dispensers to metric measurement.

2. Posting of Prices at the Dispenser -

Each retail outlet should use exclusively only one of the measurement methods of sale (gallon or liter). A change from one method to another should be carried out for all devices dispensing motor fuels in the retail outlet.

In the case of liter sales, suitable posting of per gallon and per liter prices at the device, service island, premises of the retail outlet, or any other locations must be in accordance with State and local laws, regulations, and ordinances, and in a manner that facilitates consumer comparisons between the per gallon price and the per liter price.

Additional requirements may be necessary to avoid uncertainty as to nomenclature, location, and size of information on signs.

It is recommended that:

- (a) Current and accurate price comparisons between gallon and liter values be posted at the dispenser, within easy view of the customer and visible from either side of the island.
- (b) The sign should show equivalent quantity and price information. For example:

27.1¢ per liter = \$1.026 per gallon

3.785 liters = 1 gallon
- (c) Letters and numerals should be at least 3/4 inch (19 mm) in height and 1/8 inch (3 mm) in width of stroke.

3. Quantity and Price Display on Dispensers -

It is required that dispensers be designed to clearly show all required quantity and price information on the face(s) of a motor-fuel dispenser in accordance with Handbook 44.

4. Dispenser Modification Kits -

As an interim alternative to "half-pricing," a number of computer modification kits have been installed to modify existing retail motor fuel dispensers that were not designed to compute and indicate prices over 99.9¢ per gallon.

Some of the modification kits that have been referred to State weights and measures officials for approval have been rejected as failing to conform to NBS Handbook 44 requirements.

It is recommended that all modification kits and future modifications of dispensers be so designed and made as to be in full compliance with all applicable requirements of Handbook 44.

METRIC EQUIVALENTS FOR PRICE POSTING AND
CONSUMER VALUE COMPARISON

So that accurate information and computation will be provided to and used by consumers, the following brief summary of important data and conversion factors is offered for all concerned.

Quantity Values:

The National Bureau of Standards published equivalent values are:

3.785 411 784 liters = 1 gallon

0.264 172 052 4 gallon = 1 liter

It is recommended that a "rule of reason" should apply for price posting and that the value used should be consistent with the kind and quantity of the transaction.

For consumer value comparisons, the NCWM recommends a value of 3.785* to be used to convert from price per liter to price per gallon; that is:

(Advertised, posted, or computing device unit price per liter) x 3.785 = (posted unit price per gallon, rounded to the nearest 1/10 cent.)

* Report of the Specification and Tolerances Committee, adopted by the National Conference on Weights and Measures, 1980.

Normal rules for rounding will apply. The rules for rounding off are as follows:

- (a) When the figure next beyond the last figure or place to be retained is less than 5, the figure in the last place retained is to be kept unchanged. When rounding off \$1.4713 to the nearest 0.1 cent, it is noted that the figure 3 (next beyond the last figure to be retained) is less than 5. Thus, the rounded-off value would be \$1.471.
- (b) When the figure next beyond the last figure or place to be retained is 5 or greater than 5, the figure in the last place retained is to be increased by 1. When rounding off \$1.4718 to the nearest 0.1 cent, it is noted that the figure 8 (next beyond the last figure to be retained) is greater than 5. Thus, the rounded-off value would be \$1.472.

It is important to remember that, when there are two or more figures to the right of the place where the last significant figure of the final result is to be, the entire series of such figures must be rounded off in one step and not in two or more successive rounding steps. (Expressed differently, when two or more such figures are involved, these are not to be rounded off individually, but are to be rounded off as a group.) Thus, when rounding off \$1.47149 to 0.1 cent, the result becomes \$1.471. In arriving at this result, the figures "49" are treated as a group. Since the 4 next beyond the last figure to be retained is less than 5, the "49" is dropped (see subparagraph (a) above). It would be incorrect to round off these figures successively to the left so that \$1.47149 would become \$1.4715 and then \$1.472.

For example:

26.9 cents per liter x 3.785	= \$1.018 per gallon
26.8 cents per liter x 3.785	= \$1.014 per gallon
26.7 cents per liter x 3.785	= \$1.011 per gallon
26.6 cents per liter x 3.785	= \$1.007 per gallon
26.5 cents per liter x 3.785	= \$1.003 per gallon
26.4 cents per liter x 3.785	= \$0.999 per gallon

This conversion factor is not intended for computing gallonage or for other accounting purposes; it is meant just for computing and posting prices.

(Item 204-4 was adopted)

205

OTHER ITEMS

205-1 MODEL PROGRAM FOR FIELD VERIFICATION OF DEVICES

The Committee in its Final Report of 1980 agreed to begin an extensive review of the Model State Regulation for the Voluntary

Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices and to continue to study the Model Program for Field Verification of Devices. Fairbanks Weighing Division of Colt Industries has proposed a revised Model Program taking into account some of the concerns voiced by the Committee at the 1980 NCWM.

- a. It has been broadened to include all weighing and measuring devices.
- b. It recognizes the use of variable frequency testing programs.

The proposed Model Program would make use of normal device testing and inspection with weights and measures government personnel overseeing, through variable frequency testing, performance of the service companies.

The Committee sent out a questionnaire on the Model State Regulation for Voluntary Registration of Servicepersons and Service Agencies for Commercial Weighing and Measuring Devices. The Committee would like to thank all the agencies for their responses. All 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands responded to this questionnaire. An analysis will be made of the questionnaire by the interim meeting, January 1982.

The Committee submits for information and review by the NCWM the following proposed program for field verification of weighing devices.

PROPOSED MODEL STATE PROGRAM FOR FIELD
VERIFICATION OF WEIGHING DEVICES

SECTION 1. POLICY

The Director of Weights and Measures is responsible for the enforcement of laws and regulations governing the use, accuracy, and certification of commercial weighing devices. The enforcement of Weights and Measures laws and regulations are carried out by personnel of the Director's organization; however, it is the policy of the Director to accept properly conducted and documented tests performed by private sector testing companies as official verification of device performance.

Such private sector testing companies, hereinafter referred to as "Registered Testing Companies," are required to demonstrate competence and responsibility in an initial and continuing program of registration. Concurrent with inspection and verification of device performance by Registered Testing Companies, State Weights and Measures personnel shall verify, to an extent determined by the Director, the validity of the work of the Registered Testing Companies by means of a Variable Frequency Inspection Program.

SECTION 2. TERMS AND DEFINITIONS

2.1. Commercial Weighing and Measuring Device

- 2.1.1. Any Weights and Measures device purchased, offered, or submitted for sale, hire, or reward, to be commercially used or employed in (a) establishing the size, quantity, extent, area, or measurement of things, (b) weighing articles for distribution or consumption, or (c) computing any basic charge or payment for service rendered on the basis of weights and measures.
- 2.1.2. Any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy of the device.
- 2.1.3. Weighing and measuring equipment in official use for the enforcement of law or for the collection of statistical information by Government agencies.

- 2.2. Registered Testing Company: Any private sector company or individual who has satisfied the initial and on-going requirement of the Director for registration and who, for hire, commission, or payment, conducts tests of weighing equipment and declares it fit for use in commercial trade.

- 2.3. Initial Qualification - A process of test specified by the Director that initially qualifies a private sector company or individual as a Registered Testing Company, qualified by having a knowledge of all appropriate Weights and Measures laws and regulations and by possession of, or having available for use and promising to have same on test site, Weights and Measures Standards and test equipment in sufficient quantity and of appropriate design.
- 2.4. Certificate of Registration - A certificate issued by the Director to a company that has met all requirements for registration. The certificate shall include an assigned registration number which shall remain effective until either returned by the registrant or withdrawn by the Director or for two years.
- 2.5. State Inspection - A proper test for accuracy and correctness conducted by State, county, or local employees as authorized by the Director to verify the performance of a Weights and Measures device to the standards required by law and existing regulations. The results of this test can be used to qualify or disqualify the object equipment for use in commercial trade, but is primarily intended for the evaluation of the work of the Registered Testing Company that previously authorized its use in trade.
- 2.6. Variable Frequency Inspection (VFI) - A program of random test of equipment, both "sealed" and "rejected" by a Registered Testing Company, for the purpose of developing a statistical evaluation of the work of the Registered Testing Company, and for use in determining if an owner/user is maintaining his equipment in accordance with all applicable regulations.
- 2.7. Owner/User - Any individual, firm, or organization that owns, leases, or operates a Weights and Measures device for the purpose of using that device in legal trade.
- 2.8. Device Certification Seal - Physical evidence of certification affixed to a device following approval. The seal may be in any form and may be affixed in a manner visible or not visible to the public.
- 2.9. Certificate of Accuracy - A statement issued by a Registered Testing Company or by personnel of the Director testifying to the accuracy and correctness of a weighing device at the time of examination. The certificate shall contain the name and registration number of the Testing Company, model number, serial number, description of the device, and date of inspection.

SECTION 3. RESPONSIBILITY

3.1. Owner/User

It is the responsibility of the owner/user of a weighing device:

- 3.1.1. To maintain such equipment in correct operating condition.
- 3.1.2. To operate a weighing device only in the manner indicated by its construction or that is indicated by instruction on the equipment or that is indicated in the owner's manual.
- 3.1.3. To have available for inspection by personnel of the Director's office a Certificate of Accuracy obtained within the preceding twelve months.
- 3.1.4. To notify the Director's office of any change in the status of existing commercial equipment including the addition of new equipment or removal from service of existing equipment.
- 3.1.5. To provide for the repair of any commercial weighing device found not to comply with applicable Weights and Measures laws and regulations.

3.2. Registered Testing Company

It is the responsibility of a Registered Testing Company:

- 3.2.1. To certify, for commercial service, only those devices that comply with all applicable Weights and Measures regulations.
- 3.2.2. To issue a Certificate of Accuracy to the owner/user of an approved device and, where appropriate, affix a certification seal to the device. Such inspection certificates and certification stickers are to be provided by the Director's office.
- 3.2.3. To verify any device that, following examination and test, meets all applicable regulations.
- 3.2.4. To notify the Director's office of the placing in service of any new commercial weighing device or the restoration of a rejected device.
- 3.2.5. To provide the Director, twice yearly (January 15 and July 15), with a complete list of Service Technicians covered by the Certificate of Registration.
- 3.2.6. To maintain complete and accurate records of all service, repair, reconditioning, or installation of devices covered under the Registration. Said records shall be maintained for a minimum period of two (2) years.

SECTION 4. QUALIFICATIONS OF REGISTERED TESTING COMPANY

- 4.1. Knowledge of Regulations - A Registered Testing Company or representative of said company must be knowledgeable about all regulations governing the devices covered by the Registration and be prepared to prove such knowledge in a manner acceptable to the Director.
- 4.2. Technical Knowledge - A Registered Testing Company must be able to demonstrate knowledge of the operation, repair, and calibration of the devices covered by the registration.
- 4.3. Standards - Each Registered Testing Company shall have available for use sufficient standards for the conduct of a proper test. Said standards shall be submitted to the Director or other State laboratory approved by the Director, upon demand, for certification.

SECTION 5. CLASSIFICATION

- 5.1. General - By authority of the Director, a Registered Testing company shall be authorized to provide device certification under one or all of the following registration classes: (To be stipulated by the jurisdiction).

SECTION 6. RECIPROCITY

- 6.1. The Director may enter into an informal reciprocal agreement with any other State or jurisdiction that has similar device certification programs. Under such agreement, the Registered Testing Companies of the State, party to the reciprocal agreement, are granted full reciprocal recognition of certification of standards and testing equipment in all States party to such agreement.

SECTION 7. PENALTIES

- 7.1. User/Owner - The Director may, by legislative authority, establish appropriate fines or penalties for the failure of the operator of a commercial device to comply with laws and regulations governing the use and operation of said device.
- 7.2. Registered Testing Company - The Director may, for good cause after careful investigation and consideration, fine a Testing Company or suspend or revoke its Certificate of Registration for failure to comply with laws or regulations governing the issuance of said Certificate.

SECTION 8. PUBLICATION OF LIST OF REGISTERED TESTING COMPANIES

The Director shall publish, and supply upon request, a list of Registered Testing Companies.

SECTION 9. EFFECTIVE DATE

This regulation shall become effective on _____.

Only three comments were received on the Fairbanks proposal for a Model Program for Field Verification on Devices.

The Committee sees these two subjects closely tied because they are sometimes different, sometimes complementary policies for the control of device accuracy in the marketplace. The Fairbanks proposal describes a policy that broadens the power and use of registered service companies in routine commercial device testing and approval. The existing model regulation is intended for the control over servicing of commercial devices. Both the existing model regulation and the proposal suffer from a lack of specific procedures and mechanisms whereby control may be demonstrated or maintained. This is analogous to performance standards without concomitant methods to determine a given quality level. Therefore, the Committee intends to continue the study of both items and proposes to carry them over to next year.

The Committee appreciates the input from the floor at the Open Hearings and intends to consider all of the remarks in its next deliberations, January 1982.

(Item 205-1 was adopted.)

205-2 USDA AND FDA PROPOSED NEW WEIGHT LABELING REGULATIONS

The Committees on Laws and Regulations and on Liaison met in joint open session to discuss the proposed net weight labeling regulations of FDA and USDA. The NCWM comments on these proposals were also discussed. A draft of these comments had been circulated to all State and major local Weights and Measures agencies for their input in November, 1980. The Executive Committee, which has authority to act on behalf of the NCWM, had been polled on the final letter which went to USDA and FDA. The text of the letter dated December 10, 1980 reads:

Subject: Comments on Proposed Net Weight Labeling Regulations, U. S. Department of Agriculture, Food Safety and Quality Service, (Federal Register, Volume 45, No. 155, pp. 53001-53023) and U. S. Department of Health and Human Services, Food and Drug Administration (Federal Register, Volume 45, No. 155, pp. 53023-53031).

Gentlemen:

The National Conference on Weights and Measures (NCWM) is an organization of Federal, State, and local government officials, industry and other interested persons, and organizations who meet together for the purpose of securing and maintaining uniformity in

this country's weights and measures laws, regulations, and methods of inspection. This position reflects the expertise and experience of the Conference membership who deal with net weight enforcement problems on a day-to-day basis.

The National Conference on Weights and Measures recognizes and commends the cooperative spirit and willingness of the U. S. Department of Agriculture, the Food and Drug Administration, and the National Bureau of Standards to consult among themselves and with the public (evident by the publication of proposed rules on August 8, 1980) concerning requirements for net weight labeling. These documents outlining the parallel proposals required a substantial concerted effort by these agencies, and the National Conference on Weights and Measures acknowledges the promise of uniformity inherent within them. We take this opportunity to urge both the USDA and FDA to persevere in their determination to have uniform provisions. In the same spirit of uniformity, this Conference submits this singular comprehensive letter of comment on these proposals.

An accessory prerequisite to uniform marketing and enforcement is the standardization of sampling and measuring procedures. The concept of Maximum Allowable Variations (MAV) within a standardized total sampling procedure deserves the support of all who desire uniformity. The Conference concurs and applauds these standardization efforts of the USDA and FDA.

It is the consensus of the Conference that voluntary quality control can be effective and the Conference therefore approves the deletion of any mandatory requirement from these proposals.

The National Conference on Weights and Measures believes the objective of maintaining uniformity must never be pursued through mechanisms that are inconsistent with the underlying need of all consumers to be assured they receive full measure as represented on each package at the time of purchase. To assure full measure, we believe it is the responsibility of packers, by using marketing studies and improved packaging methods and materials, to process and fill packages so that the net weight is accurate at the time of sale. Such a requirement, likewise, permits uniform enforcement by the respective enforcement jurisdictions.

The Conference strongly restates its conviction that exemption from full measure requirements of a food, solely because of its identity as a hygroscopic food, is inconsistent with the long-held Conference position on net weight. Therefore, the Conference requests FDA to drop moisture allowances from its proposals. Adherence to the Conference position maintains the status quo and places all packagers on an equal footing.

The USDA has specifically requested comments on the issue of whether or not to include absorbed liquid as part of the tare

weight. The Conference believes no part of the liquid that has been absorbed in the packaging material should be considered net weight; therefore, at least a wet tare definition must be required. Similarly, the Conference is opposed to the inclusion of excessive free liquid within a package being considered net weight. The inclusion of free liquids as part of the net weight can offer potential inducements for fraudulent packaging practices.

The proposal for handling failed product (Section 317.22 and 381.121e) is very ambiguous and limited and, if inferred correctly, states that relabeling is the only action that can be taken by an enforcement official. We would strongly object to such a measure. The proposal does not provide for any action to be taken by a State in their own courts for violation of short weight laws if such an action is felt necessary to remedy a problem. We do not believe it is the function of a State or local weights and measures official to supervise the relabeling of products. Appropriate net weight labeling is the responsibility of the packer and should not be assumed by others.

It is significant and commendable that parallel proposals have been published since the USDA and FDA have original jurisdiction over many of the packages that need uniform enforcement by Federal, State, and local jurisdictions. The National Conference on Weights and Measures wishes to recognize these efforts and urges both agencies to work towards an expeditious finalization of the regulations so they may become effective working tools for all officials, Federal, State, and local.

The Committee would like to direct the attention of the Conference to the Liaison Committee report on the status of the USDA and FDA proposed net weight labeling regulations.

(After 5 States went on record as opposing the wording of the letter, Item 205-2 was adopted.)

205-3 NBS HANDBOOK 133, STATUS REPORT

NBS Handbook 133 "Checking the Net Contents of Packaged Goods" has been published and distributed to NCWM members. Additional copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, DC 20402, Order SN-003-003-02331-1, for \$6.00 per copy.

The Office of Weights and Measures is preparing a plan for video cassette training modules (on the Handbook) and is soliciting from State and local jurisdictions, businesses, and others, what their needs for training are and will be in this area in the next three years.

An amendment from the floor was proposed consisting of the following addition to the report:

The Committee would like to request that NBS delete the first sentence of the preface in Handbook 133 which states that Handbook 133 supersedes Handbook 67.

(Item 205-3 as amended was adopted.)

205-4 PROPOSALS TO THE COMMITTEE ON LAWS AND REGULATIONS

Although the Executive Committee will propose procedures governing the introduction of proposals to standing committees, the Laws and Regulations Committee is of the view that the following procedures should be reiterated as pertaining to laws and regulations.

Incoming proposals should

- o identify the section and paragraph of an existing model law or regulation, if the proposal is intended to modify or add to the existing model;
- o provide evidence of consistency with other models or with NBS Handbook 44;
- o provide evidence of consistency with Federal laws and regulations.

(Item 205-4 was adopted.)

205-5 GENERAL RECOMMENDATIONS

The Committee wishes to include the following in its report as an informational item:

The voluntary standards of Laws and Regulations are one of the primary products of the NCWM, the long term goal of which is essentially the same as that part of the NBS Organic Act which states; "...securing uniformity in weights and measures laws and methods of inspection..."

The Committee wishes to express its full confidence in its present technical advisor, recognizing that the variety of responsibilities that she has precludes the devotion of her full time to the L & R Committee needs. Having said this, the Committee has to call attention to the number of items which had to be laid over for consideration next year, primarily because of lack of NBS technical support; this is especially true in the cases of two surveys and one data analysis. The troubling aspect of this situation is the fact that as each year's agenda is burdened by carry-overs from the previous year, the snow-balling effect will threaten the effectiveness of the Committee. The Committee intends to transmit its sentiments to the National Bureau of Standards.

(Item 205-5 was adopted.)

J. J. BARTFAI, New York, Chairman
 S. F. HINDSMAN, Arkansas
 W. R. MOSSBERG, Los Angeles County, California
 D. I. OFFNER, St. Louis, Missouri
 E. P. SKLUZACEK, Minnesota
 C. S. BRICKENKAMP, Technical Advisor, NBS
 H. F. WOLLIN, Executive Secretary, NCWM

Committee on Laws and Regulations

(On motion by the committee chairman, the report of the Committee on Laws and Regulations voting key items 200 through 205-5 was adopted in its entirety as amended by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

VOTING RESULTS--Committee on Laws and Regulations

Voting Key	House of Representatives		House of Delegates	
	Yes	No	Yes	No
201-1				
201-2				
202-1	40	0	45	0
202-2				
202-3				
202-4				
203-1	38	3	38	3
203-2	43	0	53	0
203-3				
203-4	19	21	18	36
203-5	45	0	60	1
203-6	45	0	59	0
203-7	16	27	17	40
204-1	43	0	55	0
204-2A	32	0	54	0
204-2	36	0	57	0
204-3	43	0	55	0
204-4	33	9	45	11
205-1	41	1	43	10
205-2	35	0	55	3
205-3A	42	3	47	1
205-3	39	1	57	2
205-4	41	0	57	0
205-5	39	0	48	0

A = Amendment



REPORT OF THE COMMITTEE ON
SPECIFICATIONS AND TOLERANCES

Presented by FRANK C. NAGELE, Weights and Measures
Specialist, Department of Agriculture, State of Michigan

VOTING KEY

300

INTRODUCTION

The Committee on Specifications and Tolerances submits its report to the 66th National Conference on Weights and Measures. The report consists of the interim meeting report as offered in the Conference Announcement and as amended by the final report.

The report is the recommendation of the Committee that has been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the committee. All recommended amendments are to appropriate provisions of the codes of National Bureau of Standards Handbook 44, 1980 Edition, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

NOTE: Except where paragraphs are to be added or completely revised as indicated, changes are shown as follows: that which is to be deleted is shown lined out, and that which is to be added is underlined.

The Acting Chairman of the Committee announced that this report contains three new items not included in the interim meeting report. These items are 304-6, 304-7, and 309-4. He indicated that these items were of an informational nature and that no changes to H44 would result if adopted. The presiding officer concurred with the view that these were informational items and therefore could be considered for action by the Conference in the order in which they appear with the report.

A delegate from the floor requested a parliamentary ruling on this issue. The Parliamentarian overruled the presiding officer and ruled that these items must be considered as floor amendments which required a majority of the voting delegates to debate and a two-thirds majority vote by each House for passage, with a minimum of 27 in each instance.

(A vote to debate these items was passed by the required majority.)

301

SECTION 1.12. UNITS AND SYSTEMS OF WEIGHTS AND
MEASURES, THEIR ORIGIN, DEVELOPMENT, AND PRESENT STATUS

It was brought to the attention of the Committee that this section (H-44 pages 1-17 through 1-27) was printed in the 1980 Edition without action by the NCWM. It is the view of the Committee that this information is valuable, useful, interesting, and cannot impact negatively or detrimentally on the regulatory process. The Committee recommends that this section be maintained in its present form.

(Item 301 was adopted)

302-1 G-S.1. IDENTIFICATION

It was brought to the attention of the Committee that this specification requires that equipment be marked with the name of the manufacturer and that traditionally equipment has been marked in accordance with this paragraph but in some instances with names other than the manufacturer. It is the view of the Committee that it is the intent of this paragraph that a responsible party and model be readily identifiable to both the purchaser and the enforcement jurisdiction.

To clarify this situation the Committee recommends that this paragraph be amended as follows:

Delete the words "manufacturer and with the manufacturer's designation" and insert the words "manufacturer or distributor and with their respective designation..."

(Item 302-1 was adopted)

302-2 G-T. TOLERANCES

Legal tolerances are for use by regulatory officials in determining if devices in commercial service are maintained in such a manner that the performance errors are sufficiently small that there is no serious injury to either the buyer or seller of commodities. The theory expressed by Handbook 44 with regard to acceptance and maintenance tolerances is sound; however, it is the view of the Committee that the conditions or situations when acceptance tolerances are applied are in need of change for the following reasons:

- (1) If acceptance tolerance is applicable for a test under existing Handbook 44 requirements, maintenance tolerance would be applicable for subsequent tests immediately after a device is approved. Maintenance tolerances would be applicable for all subsequent tests until a device would be officially rejected for a performance failure. We reason that if maintenance tolerances are realistic and establish acceptance limits of inaccuracy, they should be appropriate for use at all times.
- (2) If adjustment of a device to acceptance tolerance becomes necessary after an official test, the additional service cost to the device owner that can occur is difficult to justify. It is often necessary for a service firm to return several times before a device is within acceptance tolerance although it may have been within maintenance tolerance after the first service.
- (3) The cost to regulatory agencies for numerous retests necessary to verify that a device has been returned to

acceptance tolerance is difficult to justify. Funds expended for retesting a device that is within maintenance tolerance to return it to acceptance tolerance could be used for testing other devices that may not be functioning within maintenance tolerances.

- (4) Overall accuracy of devices in use should not deteriorate as a result of applying maintenance tolerances for all tests except those in G-T.1. (a) and (b) as changed. Section 2.3, Fundamental Considerations, and G-UR.4.1. and G-UR.4.3. stipulate that service personnel shall adjust as closely as possible to zero error and that equipment owners may not take advantage of the tolerances by adjusting equipment to have a value or give performance at or close to the tolerance limit. This should eliminate the possibility that equipment will be deliberately adjusted to function just within maintenance tolerances and to the benefit of the user.
- (5) It is difficult to interpret the existing paragraphs and especially difficult to define "major reconditioning or overhaul."

The Committee recommends that paragraph G-T.1. be amended to read:

G-T.1. ACCEPTANCE TOLERANCES - Acceptance tolerances shall apply as follows:

- (a) To any equipment undergoing type approval or prototype examinations.
- (b) To equipment placed into service for the first time.

The Committee is aware and wishes to inform the Conference that similar approaches are in effect in other places throughout the world; e.g., The Netherlands, the United Kingdom, and Japan.

(A motion to table this item was defeated. After a lengthy discussion, this item was defeated.)

303

SECTION 2.20. SCALES

303-1 S.1.4.2. DIGITAL INDICATIONS/VALUES DISPLAYED, TEMPERATURE CONDITIONS

Since the adoption of this specification, there have been technological advances and subsequent changes in the design of new equipment which, it is assumed, have brought about improved measurements. The principal problem that has been generated as a result is the lack of an appropriate type approval test method that can prove conclusively that equipment is designed to meet this specification. Appropriate tests can be time consuming and require the use of expensive equipment, both of which may not be readily available. The problem referenced that

brought about the adoption of this requirement was the experience of an enforcement official who in the conduct of field tests found that when equipment was not producing repeatable errors and the zero balance condition was shifting, the service representative would indicate the cause as "insufficient warm up." This caused time consuming delays for the official, not always resulting in an improvement in the test results. It is the view of the Committee that it is not necessary for a field official to determine the cause of errors, but that he need only judge the correctness of equipment on the basis of test results when using proper test methods. The Committee feels that this paragraph in its present form does not suit the needs of the system; however, it does not feel that deletion of this paragraph is the proper solution either. The Committee recommends that the National Type Approval Task Force (NTATF) develop appropriate test procedures to determine compliance with this criteria.

(Item 303-1 was adopted)

303-2 S.2. DESIGN OF BALANCE, TARE, LEVEL, DAMPING, AND ARRESTING MECHANISMS

The Committee received several comments on a number of paragraphs of this section. These comments included: (1) Paragraphs S.2.1.2, S.2.1.3, and S.2.4.1 were added in 1976 and amended in 1980 and are extremely difficult to interpret (2) Balance balls on jewelers scales should be excluded from section S.2.1.2. since it is highly unlikely and difficult for a balance ball on these devices to be used fraudulently (3) The manual zero setting mechanism with an operating range of one division or less, which is used on some scales, should be excluded from paragraph S.2.1.2. (4) Also in paragraph S.2.1.3. there should be a reference that for testing purposes, readily accessible means should be provided to deactivate the automatic zero setting mechanism. The Committee agrees with these comments for the most part and feels that the following recommendation for code amendments will clarify and correct the conditions referenced.

Amend S.2.1.2. to read:

S.2.1.2. ON SCALES USED IN DIRECT SALES - A manual zero setting mechanism (except those on prescription or jewelers balances or those with an operating range of one scale division or less) shall be operable or accessible only by a tool outside of and entirely separate from this mechanism or enclosed in a cabinet.

On applicable scales a balance ball either shall meet this requirement or shall not itself be rotatable.

A semi-automatic zero setting mechanism shall be operable or accessible only by a tool outside of and entirely separate from this mechanism or enclosed in a cabinet, or shall be operable only when the indication is stable within:

(a) plus or minus 3 scale divisions (d_d) for scales of more than 5000 pounds capacity in service prior to January 1, 1981 and for all axle load, railway track, and vehicle scales.

(b) plus or minus 1 scale division (d_d) for all other scales.
[Amended 1981]

Amend S.2.1.3. to read:

S.2.1.3. ON SCALES EQUIPPED WITH AN AUTOMATIC ZERO SETTING MECHANISM. - Under normal operating conditions, the maximum load that can be "rezeroed" when all at once either placed on or removed from the platform shall be:

a) For bench, counter, and livestock scales - 0.6 scale division.

b) For axle load, railway track, and vehicle scales - 3.0 scale divisions,

c) For all other scales - 1.0 scale division.

(Nonretroactive and enforceable as of January 1, 1981)
[Amended 1981]

Amend S.2.4.1. to read:

S.2.4.1. ELECTRONIC ELEMENTS.- Electronic indicating elements equipped with recording elements shall be equipped with effective means to permit the recording of weight values only when the indication is stable within:

a) plus or minus 3 scale divisions (d_d) for scales of more than 5000 pounds capacity in service prior to January 1, 1981 and for all axle load, railway track, livestock, and vehicle scales.

b) plus or minus 1 scale division (d_d) for all other scales.
[amended 1981]

The value recorded shall be within applicable tolerances.

With respect to the recommendation received that paragraph S.2.1.3. be amended by adding "For testing purposes, readily accessible means shall be provided to deactivate the automatic zero setting mechanism," it is the view of the Committee that the width of zero must be determined on all devices undergoing pattern approval or prototype examinations and/or initial verification tests. It is also the Committee's view that compliance can be determined on devices not equipped with an external switch for deactivating the automatic zero setting mechanism by placing test loads on the platform equal to 5 scale divisions. In those cases when the zero width exceeds $\pm 0.6 d$, the scale would indicate a quantity other than that equal to the $5 d$ test load and therefore

would not be in compliance. The Committee feels that this methodology is appropriate and does not recommend code amendment.

(Item 303-2 was adopted)

303-3 T. TOLERANCES

Several years ago, the Committee recognized a need for a complete review of this Section for the following reasons (a) International harmonization, (b) simplification, (c) new technology, and (d) equity. The Committee was aware that this was a massive task and requested the aid of the SMA recommending that they establish a subcommittee comprised of SMA members, and other interested parties for this vitally needed work. The SMA did accept this challenge and a chairman was appointed and a subcommittee established. On March 5, 1981 the subcommittee completed this effort after 2000 meeting man hours, with 44 participating individuals, representing 22 organizations. The Committee (S & T) expresses its deepest appreciation and gratitude to SMA, the subcommittee chairman, the subcommittee, and to all others contributing to this tremendous effort and presents for Conference review the Final Report in its entirety.

It is the Committee's view that most of the material contained in this report is acceptable for immediate inclusion in H-44. However, the Committee would be premature in recommending Conference action on such extensive changes without providing adequate time for review by all those Conference members who have not had the opportunity to participate in its development. The Committee will have prepared by its next interim meeting its recommendation for a complete new scale code, which will be circulated to all Conference members by March 1, 1982. This recommendation will include most of the material presented in the Tolerances Subcommittee Final Report.

There remains to be resolved, however, a major issue with respect to the tolerance values for vehicle, axle load, livestock, crane, hopper (other than grain hopper), and railway track scales. The Committee does not view Table III B of the tolerance subcommittee final report as the best solution to this problem.

The Committee has reviewed all of the available material, including the Final Report of the Subcommittee, OIML International Recommendations 3 and 28, the first, second, and third draft revisions of IR 3 and offers its comments on the tolerance issue following the subcommittee final report (see page 27). It is the view of the Committee that the principles expressed therein are appropriate for use in the U.S. and although not the same as those presently recommended in OIML, they are compatible with OIML recommendations and if adopted, International trade barriers will not result. The Committee recognizes that change is often difficult to accomplish and that a complete understanding of changes being considered and their impact are necessary. Therefore, the Committee urges all manufacturers, users, and weights

and measures officials to study thoroughly these recommendations, so that when Conference action is recommended, the issue can be resolved on the basis of knowledge rather than the lack of it.

PROPOSED REGULATIONS
FOR
WEIGHING DEVICE TOLERANCES

NOTICE

This document represents work of the expanded Tolerance Subcommittee of the Scale Manufacturers Association toward the development of a proposed national standard.

The reader is cautioned that this document has not been approved as of this date and cannot be presumed to reflect the position of SMA or any other committee, society, or group.

All subcommittee members were in unanimous agreement with this final document with the exception of the tolerance table IIIB for which there were divergent viewpoints. These viewpoints are attached as Appendix C.

SMA Expanded Tolerance Subcommittee
Final
March 5, 1981

FOREWORD

This final document represents an effort over a two year period (1979-81) by the Tolerance Subcommittee of the Scale Manufacturers Association which was expanded during 1980 to include membership from NBS-OWM, NCWM S & T Committee, USDA Federal Grain and Inspection Service, USDA Packers and Stockyards, American Railway Engineering Association, State Weights and Measure officials, and others.

The purpose of this work was the development of a simplified and rationalized tolerance structure in a form suitable for a proposal to the National Conference on Weights and Measures. It was the expectation of the subcommittee that the new tolerance structure, if and when it was approved by the conference, would be integrated into the NBS Handbook 44 through normal conference procedures.

All subcommittee members were in unanimous agreement with this final document with the exception of the tolerance table IIIB for which there were divergent viewpoints. These viewpoints are attached as Appendix C.

Membership of the Expanded Tolerance Subcommittee were as follows:

Regular Members:

O. T. Almarode AREA Virginia Office W&M	M. R. Gruber, Jr. SW&IB - AREA-34
J. N. Aquadro Howe Richardson Scale Co.	S. D. Hejzlar J. Chatillon & Sons, Inc.
B. Banks USDA FGIS	R. H. Hurley Fairbanks Weighing Div.
J. R. Caldicott Streeteramet, Measurement Systems Division	W. T. James Cardinal Scale Mfg. Co.
R. E. Callihan Fairbanks Weighing Division	F. Katterheinrich Hobart Corporation
H. S. Christensen SMA	H. E. Lockery Hottinger Baldwin Measurement Inc.
L. H. DeGrange NCWM S&T Maryland Office of W&M	C. H. Oakley USDA - P&S AMS
J. J. Elengo, Jr., Chairman Revere Corporation of America	P. R. Perino Transducers, Inc.
W. A. Grotz, Jr. AREA - AAR	R. R. Pforr USDA FGIS

M. Spoor
BLH Electronics

D. E. Tonini, Secretary
SMA

T. M. Stabler
Toledo Scale

O. K. Warnlof
NBS OWM NCWM

Contributing Members:

E. Boshinski
Hobart Corporation

R. T. Brumbaugh
Systems Associates, Inc.

R. F. Caris
Interface, Inc.

L. T. Cerny
AREA

K. Cotten
AREA Chessie System

P. Coughlin
Analogic Corporation

M. Goedde
National Grain & Feed Assoc.

W. V. Goodpaster
NSMA

J. A. Johnson
National Grain & Feed
Assoc., Cargil Inc.

A. W. Kroll
Fairbanks

Dr. H. H. Ku
NBS

L. L. Lowery
N&W Railway Company

J. E. Maness
National Grain & Feed Assoc.

C. T. Picton
Conrail

J. J. Robinson
AAR

M. Tovey
Interface, Inc.

F. Whipple
Fairbanks Weighing Div.

G. Wilson
Analogic Corporation

N. A. Wilson
Seaboard Coastline
Railway Company

R. Zweig
John Chatillon & Sons

SMA EXPANDED TOLERANCE SUBCOMMITTEE

FINAL DRAFT

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PROPOSED TOLERANCE REGULATIONS

1. SCOPE

This code applies to all types of weighing devices other than belt conveyor scales, and is intended to provide a base structure from which specific quantified objectives for performance of weighing devices (when subjected to pattern approval, initial verification, and subsequent verification) may be determined.

2. PRINCIPLES OF THE TOLERANCE REGULATIONS

This tolerance regulation is based on the following general principles:

- 2.1 The tolerance requirement of the weighing device is related to the value of the minimum division (d), and is expressed in terms of a division.
- 2.2 The tolerance requirement for a weighing device is a performance requirement independent of the design principle employed.

3. ACCURACY CLASSES

Weighing devices are divided into five Accuracy Classes whose designations are:

CLASS I
CLASS II
CLASS IIIA
CLASS IIIB
CLASS IV

4. TOLERANCES FOR INDICATING OR RECORDING WEIGHT

4.1 Tolerance Values

- 4.1.1 The tolerance values are positive (+) and negative (-), with the weighing device adjusted to zero at no load. When tare is in use, the tolerance values are applied from the tare zero reference.
- 4.1.2 The tolerances apply for increasing and decreasing loads within the temperature limits stated in paragraph 9.2.

4.1.3 In the case of multiple range weighing devices, tolerances are based on the division (d) of the range in use.

4.1.4 Tolerance values are given in Table 1 and are expressed in divisions (d).

4.2 Zeroing

The act of setting the reference point, at zero or tare, from which a weight indication or recording is obtained shall be carried out to an accuracy of $\pm \frac{1}{4}$ (one-fourth) of a scale division or better. This requirement is not intended as a zero repeatability requirement to which section 7 applies.

4.3 Taring

The tolerance for a weighing device equipped with a tare element is applied to the net load.

4.4 Relative Error at Low Load Values

At low load values, the uncertainty of the indicated reading may produce a large relative error as shown in the following table:

Load (Expressed in d)	Relative Error (in percent)
50	1.0
20	2.5
10	5.0

4.5 Separate Main Elements: Load Transmitting Element, Indicating Element, etc.

It is not the intent of this paragraph to require that a weighing device employ separately approved elements. However, if a main element, separate from a weighing device, is submitted for pattern approval, the tolerance for the element is no more than 0.7 times that for the complete weighing device. This decimal fraction includes the tolerance attributable to the testing devices used.

Table 1
TOLERANCE VALUES

CLASS I

Test Load Expressed in d		Pattern Approval	
Greater Than	To and Including	and Initial Verification	Subsequent Verification
0	50,000	$\frac{1}{2}$ d	1 d
50,000	200,000	1 d	2 d
200,000	400,000	$1\frac{1}{2}$ d	3 d
400,000	-	$2\frac{1}{2}$ d	5 d

CLASS II

0	5,000	$\frac{1}{2}$ d	1 d
5,000	20,000	1 d	2 d
20,000	40,000	$1\frac{1}{2}$ d	3 d
40,000	100,000	$2\frac{1}{2}$ d	5 d

CLASS III A

0	500	$\frac{1}{2}$ d	1 d
500	2,000	1 d	2 d
2,000	4,000	$1\frac{1}{2}$ d	3 d
4,000	10,000	$2\frac{1}{2}$ d	5 d

CLASS III B

0	500	$\frac{1}{2}$ d	1 d
500	1000	1 d	2 d
1000	2000	2 d	4 d
2000	4000	3 d	6 d
4000	10,000	5 d	10 d
10,000	40,000	8 d	16 d

CLASS IV

0	50	$\frac{1}{2}$ d	1 d
50	200	1 d	2 d
200	400	$1\frac{1}{2}$ d	3 d
400	1,000	$2\frac{1}{2}$ d	5 d

4.6 In-Motion Weighing

Tolerances for in-motion weighing of a group of weighments appropriate to the application must satisfy the following conditions:

- 4.6.1 For any group of weighments, the error in the total of the individual weights of the group must be within the total of the subsequent verification static tolerances appropriate to the weights of the group; and
- 4.6.2 For any single weighment within a group, the weighment errors shall not exceed:

<u>Percentage of Group</u>	<u>Subsequent Verification Static Tolerance Multiplier</u>
65%	1.0
30%	2.0
5%	3.0

- 4.6.3 For any group of weighments wherein the sole purpose is to determine the total of the group of weighments, 4.6.1 alone applies.
- 4.6.4 For any single weighment within a group of non-interactive (i.e. uncoupled) loads, the weighment error shall not exceed the subsequent verification static tolerance.

5. AGREEMENT OF INDICATIONS

5.1 Multiple Indicating/Recording Elements, Multiple Balancing Method

In the case of multi-indicating/recording elements, tolerances shall be applied independently to each separate indicating and recording element of a weighing device.

5.2 Single Indicating/Recording Element, Multiple Balancing Method

For a single indicator, the indications shall agree within one half division when the method of balancing is changed (e.g. counter-poise weights applied to the tip of a weighbeam, unit weights with a dial, etc.).

5.3 Multiple Indicating/Recording Element, Single Balancing Method

For a weighing device equipped with multiple elements, used for indicating and/or recording, and a single means for balancing: For the same load,

- 5.3.1 Except for graduated tare elements, indications or printed values, when taken in pairs, shall agree within one half of the smallest division in use.
- 5.3.2 A weight value provided by a graduated tare element shall agree with an indication or printed result within one half of the smallest indicated or printed division in use, excluding the tare element.

- 5.4 At constant test conditions the indication 20 seconds after application of load, and the indication after one hour, shall not differ by more than the absolute value of the tolerance for the applied load.

6. VERIFICATION (TESTING) STANDARDS

Standard weights or masses used in verifying weighing devices shall comply with requirements of NBS Handbook 105-1 (Class F).

7. REPEATABILITY

- 7.1 The results obtained under reasonably constant static test conditions, by several weighings of the same load, shall agree within the absolute value of the subsequent verification tolerance for that load.
- 7.2 Any two results obtained under reasonably constant static test conditions, during the shift test, or section test, shall agree within the absolute value of the subsequent verification tolerance for that load.

8. SENSITIVITY AND DISCRIMINATION

- 8.1 Sensitivity - The sensitivity test shall be conducted on non-automatic indicating (beam) weighing devices only, with the weighing device in equilibrium at zero-load and at maximum test load.

- 8.1.1 A test load, equivalent to 1d at zero and 2d at maximum test load shall cause a permanent change of at least:
- a) On a scale with trig loop but without a balance indicator, the position of the weighbeam shall change from the center to the outer limit of the trig loop.
 - b) On a scale with balance indicator, the position of the indicator shall change at least one division on the graduated scale, the width of the central target area, or the following value, whichever is greater.

- 1 mm (0.04 inch) for scales of Class I and II.
- 2 mm (0.08 inch) for scales of Classes III and IV with a maximum capacity of 30 kg (67.2 lb) or less.
- 5 mm (0.20 inch) for scales of Classes III and IV with a maximum capacity of more than 30 kg (67.2 lb).

8.2 Discrimination - The discrimination test shall be conducted with the weighing device in equilibrium, at zero load and at maximum test load.

8.2.1 Automatic indicating - analog (i.e., weighing device with dial, drum, fan, etc.): A test load equal in value to the minimum division shall cause a permanent change to the indication by at least 0.7 of the test load.

8.2.2 Automatic indicating - digital: A test load, equivalent to 1.4 times the minimum division, shall cause a change of indication or printed value by two divisions. This requires that the zone of uncertainty shall not be greater than 0.3 of the value of minimum division.

(Note: The discrimination test is conducted from the lower or upper edge of the zone of uncertainty for increasing and decreasing load tests, respectively.)

9. INFLUENCE QUANTITIES

9.1 Level

If the performance of a portable scale is changed by an amount greater than the appropriate tolerance when it is moved from a level position and rebalanced in a position that is out of level in any direction by 5%, or approximately 3 degrees, the scale shall be equipped with level indicating means. (There is no additional tolerance allowance for out-of-level operating conditions.)

9.2 Temperature

Devices shall satisfy the tolerance requirements under the following temperature conditions:

9.2.1 If not marked on the device, the temperature limits are:

<u>Classes</u>	<u>Temperature</u>
I	+10 °C (50 °F) to +30 °C (86 °F)
II	+10 °C (50 °F) to +30 °C (86 °F)
III	-10 °C (14 °F) to +40 °C (104 °F)
IV	-10 °C (14 °F) to +40 °C (104 °F)

- 9.2.2 If temperature limits are marked on the device, the range shall be at least:

<u>Classes</u>	<u>Minimum Temperature Range</u>
I	1 °C (2 °F) or 5 °C (9 °F)
II	15 °C (27 °F)
III	30 °C (54 °F)
IV	30 °C (54 °F)

Unless the working temperature range is -10 to +40 °C, the working temperature range shall be stated on the identification plate.

- 9.2.3 Temperature Effect on Zero-Load Balance: The zero-load indication shall not vary by more than 1 division per 5 °C change in temperature.
- 9.2.4 Operating Temperature: An indicating or recording element shall not display or record any usable values until the operating temperature necessary for accurate weighing and a stable zero balance condition has been attained.

9.3 Humidity

If no particular humidity limit is specified, the weighing device must satisfy the conditions defined in paragraphs 4 through 9 inclusive within the following humidity limits:

10 to 95% Relative Humidity, non-condensing

9.4 Electric Power Supply

- 9.4.1 Line Voltage and Frequency
Weighing devices that operate using alternating current must perform within the conditions defined in paragraphs 4 through 9 inclusive over the line voltage range of 100-125 volts rms and over the frequency range of 59.5 to 60.5 Hz.
- 9.4.2 Battery-operated instruments must perform over the power source range of 80 to 100 percent of fully battery rated voltage, and meet the conditions defined in paragraphs 4 through 9 inclusive.

9.4.3 Power Interruption

An indicating or recording element shall not display or record any out-of-tolerance values caused by power interruptions.

9.5 Barometric Pressure

The zero indication must not vary by more than one (1) scale division for a change in barometric pressure of 1 kilopascal over the total barometric pressure range of 112 to 124 kilopascals (28 to 31 inches Hg).

9.6 Undefined Influence Factors

Other influence quantities exist and should be taken into account when applying weighing systems. These include:

Motion

Vibration - steady state and transient

Wind

Snow and Rain

Wash Down

Gravitational Effects

Radiation Effects

Adverse Loads - Side Loads

Adverse Loads - Shock Loads

Temperature Gradients

EMI/RFI

Etc.

10. APPLICATION OF THE PROPOSED TOLERANCE REGULATION T_C PATTERN APPROVAL, INITIAL & SUBSEQUENT VERIFICATION

X - Yes
O - No
- - N.A.

Paragraph No.	ITEM	PATTERN APPROVAL	INITIAL VERIFICATION	SUBSEQUENT VERIFICATION
1.	<u>Scope</u>	X	X	X
2.	<u>Principles of the Tolerance Regulations</u>	X	X	X
3.	<u>Accuracy Classes</u>	X	X	X
4.	<u>Tolerances for Indicating or Recording Weight</u>			
4.1	Tolerance Values	-	-	-
4.1.1.	Adjustment to Zero	X	X	X
4.1.2.	Increasing & Decreasing Loads	X	X	X

Paragraph No.	ITEM	PATTERN APPROVAL	INITIAL VERI- FICATION	SUBSEQUENT VERI- FICATION
4.1.3.	Multiple Range	X	X	X
4.1.4.	Tolerances Expressed in Divisions	X	X	X
4.2	Zeroing	X	X	X*
4.3	Taring	X	X	X
4.4	Relative Error at Low Load Values	-	-	-
4.5	Separate Main Elements	X	O	O
4.6	In-Motion Weighing			
4.6.1	Error in Total of Individual Weights			
4.6.2	Single Weighment within a Group			
4.6.3	Any Group of Weighments to Determine Total			
4.6.4	Single Weighment in a Group Non-Interactive			
5.	<u>Agreement of Indications</u>	-	-	-
5.1	Multiple Indicating/Recording Elements, Multiple Balancing Method			
5.2	Single Indicating/Recording Element, Multiple Balancing Method	X	X	X
5.3	Multiple Indicating/Recording Element, Single Balancing Method	-	-	-
5.3.1	Pairs Except Tare Elements	X	X	X
5.3.2	Provided by Graduated Tare	X	X	X
5.4	Variation of Indications	X	O	O
6.	<u>Verifications (Testing)</u>			
	<u>Standards</u>	X	X	X
7.	<u>Repeatability</u>	-	-	-
7.1.	Several Weighings	X	X	X
7.2.	Two Results During Shift or Section Tests	X	X	X
8.	<u>Sensitivity & Discrimination</u>	-	-	-
8.1	<u>Sensitivity</u>	X	X	X
8.1.1.	Test Load Permanent Change	X	X	X
8.2.	<u>Discrimination</u>			
8.2.1.	Automatic Indicating-Analog	X	X	X
8.2.2.	Automatic Indicating-Digital	X	X	O
9.	<u>Influence Quantities</u>	-	-	-
9.1.	Level	X	O	O

*For further consideration

Paragraph No.	ITEM	PATTERN APPROVAL	INITIAL VERI- FICATION	SUBSEQUENT VERI- FICATION
9.2.	Temperature	-	-	-
9.2.1.	Unmarked Class: Temperature Limits	X	0	0
9.2.2.	Marked	X	0	0
9.2.3.	Temperature on Zero Load	X	0	0
9.2.4.	Operating Temperature	X	X	X
9.3.	Humidity	X	0	0
9.4.	Electric Power Supply	-	-	-
9.4.1.	Line Voltage & Frequency	X	0	0
9.4.2.	Battery-Operated	X	0	0
9.4.3.	Power Interruptions	X	0	0
9.5.	Barometric Pressure	X	0	0
9.6.	Undefined Influence Factors	-	-	-
	Vibration			
	Wind			
	Snow & Rain			
	Wash Down			
	Gravitational Effects			
	Radiation Effects			
	Adverse Loads - Side Loads			
	Adverse Loads - Shock Loads			
	Temperature Gradients			
	EMI/RFI			
	Motion			
	Etc.			

APPENDIX A

Approximate Classification of Weighing Devices by Current Regulations

Class	Weighing Device Type
I	Special-Precision Laboratory Weighing Devices
II	Precision Laboratory Weighing Devices. Precious Metals and Gem Weighing Devices.
III A	All Commercial Scales not otherwise specified. Table 4 NBS Handbook 44 Weighing Devices. FGIS Weighing Devices.
III B	Railway Track Weighing Devices except FGIS. Vehicle Weighing Devices except FGIS. Hopper Weighing Devices other than Grain Hopper. Crane Weighing Devices. Livestock and Animal Weighing Devices. Axle Load Weighing Devices.
IV	Law enforcement other than axle load. Service Weighing Devices (non-custody transfer)

APPENDIX B

Effectivity Recommendation

Non-Retroactive	Four Years After Adoption
Retroactive	Ten Years After Adoption

APPENDIX C

Viewpoints on Tolerance Table IIIB

(1) Rationale Supporting Inclusion of Table IIIB

- ° Permits high resolution for high capacity scales requiring 0.2% (maintenance) tolerance.
- ° Since the U.S. may not be prepared to accept OIML IR3 tolerances without some modification, there should be provisions to accommodate those weighing practices currently accepted in the U.S.
- ° Table IIIB roughly accommodates a relative error tolerance structure for high capacity, high resolution scales.

(2) Rationale Against Inclusion of Table IIIB

- ° Table IIIB violates the Committee's guidelines to establish a tolerance structure free from exceptions for scales regardless of technology and intended application.
- ° Tolerances for medium and heavy capacity scales are unnecessarily tightened in the upper weighing range of such devices.
- ° The addition of the Class IIIB Table adds nothing to the commercial measurement system with respect to either accuracy or equity.
- ° Tolerances in weighing should be based on what is being weighed and not the device used for the weighing (i.e., the relative tolerance system of percent of applied load is not the most logical and equitable).
- ° Proposed Class IIIB Table does not harmonize with OIML, it does not contribute to a simplification of the tolerance structure although tolerances are expressed in terms of scale divisions, it maintains, unnecessarily, a relative error concept.
- ° Acceptance by NCWM and scale users is considered unlikely.
- ° While the tolerance is double that of a 0.1% scale, it allows a resolution double, triple, or even quadruple that of most 0.1% scales.
- ° Adoption of Class IIIB Table will eventually lead to a proliferation of additional classes and tables to satisfy special interest groups thus defeating the primary objective of developing a simplified tolerance structure.

- ° Class IIIB Table encourages the practice of displaying meaningless indicator divisions essentially unrelated to accuracy.
- ° Table IIIB fails to address the fundamental question of equity, i.e., that the resolution should be indicative of the accuracy of the weightment. It represents a poor attempt of having a step tolerance approximate a percentage tolerance.
- ° It maintains a relative error concept although the tolerance values are expressed in terms of scale divisions.
- ° Using Table IIIB, regulator tests of heavy capacity scales at relatively light loads will not assure accuracy at full capacity.
- ° The constant fixed error system is not a logical tolerance structure. The "proportional approach" should be accepted as a basis for a national tolerance structure and be concerned with the tolerance principles and structures rather than absolute values.

(3) Rationale for Adopting a Technically Pure Approach to Table IIIB

- ° It is possible to have 0.2% nominal (maintenance) tolerance scale with the original Class III Table. However, it does not fit as well as a 0.1% (maintenance) tolerance scale. The solution to this difficulty is to expand the structure by an additional Table IIIB. The most logical progression of tolerance tables to satisfy the need for a 0.2% (maintenance) tolerance and to follow the precise logic which distinguishes Class I from Class II, from Class IIIA, from Class IV, and simultaneously provide for Class IIIB, is to provide a Class IIIB Tab as follows:

Tolerances

Test Load Expressed in Divisions Greater Than To & Including		Pattern Approval and Initial Verification (acceptance)	Subsequent Verification (maintenance)
0	250	$\frac{1}{2}$ d	1 d
250	1000	1 d	2 d
1000	2000	$1\frac{1}{2}$ d	3 d
2000	5000	$2\frac{1}{2}$ d	5 d

MINORITY POSITION ON INITIAL AND SUBSEQUENT TOLERANCES

(Minute Item TE0046)

Legal tolerances are for use by regulatory officials in determining if devices in commercial service are maintained in such a manner that the performance errors are sufficiently small and that there is no serious injury to either the buyer or seller (of commodities.) The theory expressed by H-44 with regard to acceptance and maintenance tolerance is sound. A minority of subcommittee members believe that the time frame when acceptance tolerance is applied warrants further study and is in need of change.

It is felt that the application of acceptance tolerances is appropriate when a device is subject to pattern approval and initial verification. During all subsequent inspections a device would only be required to meet maintenance tolerance regardless of its past performance.

The logic for this position follows:

1. If an official test is conducted and acceptance tolerance is applicable under existing H-44 requirements, maintenance tolerance becomes applicable immediately for subsequent tests until it may be rejected for a performance failure. We reason that if maintenance tolerance is realistic and establishes acceptance limits of inaccuracy it should be appropriate for use at all times.
2. If adjustment of a device to acceptance tolerance becomes necessary after an official test, the additional service cost to the device owner which can occur is difficult to justify. Often, it is necessary for a scale service firm to return several times before a device is within acceptance tolerance in spite of the fact it may have been within maintenance tolerance after the first service.
3. The cost to regulatory agencies for numerous retests necessary to verify that a device is within acceptance tolerance as described in (2) is difficult to justify. Funds expended for retests of a single device could be used for testing other devices that may not meet maintenance tolerances.
4. Accuracy of devices should not deteriorate as a result of the application of maintenance tolerance for all subsequent tests. Section 2.3 Fundamentals H-44 stipulates that a serviceman should adjust as close as possible to zero error and that equipment owners may not take advantage of the tolerance. It appears that this should eliminate a tendency by service personnel to adjust so that a device is just within maintenance tolerance limitations.

MINUTE ITEM TE0046 DATED JULY 15-16, 1980

A question was raised as to what constitutes initial verification. It was explained that initial verification is intended to be the very first time the device is tested; thereafter, testing is accomplished using subsequent tolerances. The discussion lead to a review of the terms, pattern, initial, and subsequent testing. A question was asked as to what is the point of listing initial testing since it was a one-time event, and applies to each scale when it is first installed in the field. It was stated that H-44 approach has merit, allowing for wear from use since the field inspector needs this kind of guide. When scale adjustments are made, they should be toward the initial verification tolerance. It was further stated that "Tolerance should be considered a legal limit". The discussion developed about a philosophy that W&M officials should have only one tolerance to enforce, and that there is a greater apparent cost involved in maintaining a scale under initial verification tolerance over that of a subsequent tolerance. At this point the chairman summarized these viewpoints as follows:

Viewpoint A - (To take the scale back to Initial after Subsequent failure)

- 1) Scale repairman/adjuster needs a closer target to shoot at. "Do not bias" is too general, more motherhood than practical.
- 2) You need to go back to Initial to "guarantee" that the scale will be accurate with future time.
- 3) From some owners' standpoint the desire is to pay for a "better job."

Viewpoint B - (Initial Tolerance applies to first test only, after which Subsequent applies)

- 1) Service cost to achieve return to Initial is "too great."
- 2) When Initial Verification Tolerances are applied, enforcement officials encounter need to return several times for repeat tests, as the service company tries to meet Initial Verification.

Observations:

- 1) Some who hold Viewpoint A, agree with same tolerances for Initial and Subsequent provided it is small.
- 2) Some say you save money by going back to Initial. Some say it "costs" money. Perhaps if just meeting legal need, the owner might not work as hard as he would if it was to his benefit to maintain optimum accuracy.

It was pointed out that people do not comply until forced with a legal mandate and there is no incentive for the owner to change as long as the errors favor him. When a scale fails after a weighing bureau retest, all other inspections are on a reimbursable basis.

There was a consensus on the philosophical desirability of returning a scale to initial tolerance requirement and a clear minority disagreement mainly because of costs involved in retesting to initial tolerance values.

MINORITY POSITION (Minute Item TE0046)

In the event that a weighing device fails to meet subsequent tolerances when inspected, its performance shall be returned to initial tolerances prior to placement back in service.

COMMENTS OF SPECIFICATIONS AND TOLERANCES COMMITTEE:

1. Scales can be divided into four (4) accuracy classes as follows:

Class	Scale Interval d	Number of Scale Divisions		Minimum Capacity
		$n = \frac{\text{Max}}{d}$		Min
		Minimum	Maximum	
I	- Special Accuracy			
	$d \leq 0.5 \text{ mg}$	100	-	100 d
	$1 \text{ mg} \leq d$	50 000	-	
II	- High Accuracy			
	$1 \text{ mg} \leq d \leq 100 \text{ mg}$	100	50 000	100 d
	$200 \text{ mg} \leq d$	5 000	50 000	
III	- Medium Accuracy			
	$0.1 \text{ g} \leq d \leq 5 \text{ g}$	100	10 000	20 d
	$10 \text{ g} \leq d$	500	10 000	
IV	- Ordinary Accuracy			
	$5 \text{ g} \leq d$	100	1 000	10 d

Examples

Class I Precision Laboratory Balances, etc.
 Class II Grain Test, Jewelers Scales, etc.
 Class III Livestock, Retail, Vehicle, Hopper, Axle-load, etc.
 Class IV Wheel-load Weighers, etc.

2. Tolerances apply to increasing, decreasing, and shift test loads.
3. Tolerances apply to automatic and non-automatic indicating scales and their attachments.
4. The tolerance (maximum permissible error) of a scale is related to the value of the scale division (d), and is expressed in terms of the division.
5. In the case of multiple range (variable scale division) devices, the tolerance is one division of the range in use.

ACCEPTANCE TOLERANCES

Scale Divisions				
Class	1/2 d	1 d	1 1/2 d	2 1/2 d
I	0 - 50 000	50 001 - 200 000	200 001 +	
II	0 - 5 000	5 001 - 20 000	20 001 + 50 000	
III	0 - 500	501 - 2 000	2 001 - 4 000	4 000 +
IV	0 - 50	51 - 200	201 - 400	400 +

Maintenance tolerance is equal to two times acceptance tolerance.

The Committee also offers the following information.

It has been assumed that if large capacity scales subject to OIML IR#3 maximum permissible error are designed with a fewer number of divisions (2000 rather than 10 000) larger weighing errors will result at the "low end" of the weighing range.

It is the intent of that which follows to illustrate that this is not so. For this exercise, certain reasonable assumptions must be made since little data is readily available.

Assumptions:

1. Scale performance tends to be linear.
2. Scales are manufactured to perform within a relative error band of $\pm 0.1\%$ and perfection is not attainable.
3. Most weighings are in random amounts.
4. A random number table will clearly illustrate that the actual quantities weighed will "average out"; i.e., there will be as many weighings ending on one side of a given number as on the other side. For example, there will be as many weighings ending in 24 as there are in 26, as many in 23 as in 27, as many in 22 as 28, etc.

Given:

Scale Design:

Capacity: 100 000 pounds

Value of Scale Division: 10 pounds or 50 pounds

The scale has a relative error of $\pm 0.1\%$ of applied load. Standard test weights are applied in 1000 pound increments.

Actual Weight Plus 0.1% Error (Pounds)	10 lb Division		50 lb Division	
	Scale Indication	Error*	Scale Indication	Error*
1 001	1 000	0	1 000	0
2 002	2 000	0	2 000	0
3 003	3 000	0	3 000	0
4 004	4 000	0	4 000	0
5 005	5 000	0	5 000	0
6 006	6 010	+10	6 000	0
7 007	7 010	+10	7 000	0
8 008	8 010	+10	8 000	0
9 009	9 010	+10	9 000	0
10 010	10 010	+10	10 000	0
11 011	11 010	+10	11 000	0
12 012	12 010	+10	12 000	0
13 013	13 010	+10	13 000	0
14 014	14 010	+10	14 000	0
15 015	15 020	+20	15 000	0
16 016	16 020	+20	16 000	0
17 017	17 020	+20	17 000	0
18 018	18 020	+20	18 000	0
19 019	19 020	+20	19 000	0
20 020	20 020	+20	20 000	0
21 021	21 020	+20	21 000	0
22 022	22 020	+20	22 000	0
23 023	23 020	+20	23 000	0
24 024	24 020	+20	24 000	0
25 025	25 020	+20	25 000	0
Total 1st Quarter		+310		0

* Error: Difference of Scale Indication from Absolute Zero Error.

Actual Weight Plus 0.1% Error (Pounds)	10 lb Division		50 lb Division	
	Scale Indication	Error*	Scale Indication	Error*
26 026	26 030	+30	26 050	+50
27 027	27 030	+30	27 050	+50
28 028	28 030	+30	28 050	+50
29 029	29 030	+30	29 050	+50
30 030	30 030	+30	30 050	+50
31 031	31 030	+30	31 050	+50
32 032	32 030	+30	32 050	+50
33 033	33 030	+30	33 050	+50
34 034	34 030	+30	34 050	+50
35 035	35 040	+40	35 050	+50
36 036	36 040	+40	36 050	+50
37 037	37 040	+40	37 050	+50
38 038	38 040	+40	38 050	+50
39 039	39 040	+40	39 050	+50
40 040	40 040	+40	40 050	+50
41 041	41 040	+40	41 050	+50
42 042	42 040	+40	42 050	+50
43 043	43 040	+40	43 050	+50
44 044	44 040	+40	44 050	+50
45 045	45 040	+40	45 050	+50
46 046	46 050	+50	46 050	+50
47 047	47 050	+50	47 050	+50
48 048	48 050	+50	48 050	+50
49 049	49 050	+50	49 050	+50
50 050	50 050	+50	50 050	+50
Total 2nd Quarter		+960	+1 250	
Total Previous Quarter		+310	0	
Total 1st Half		+1 270	+1 250	

* Error: Difference of Scale Indication from Absolute Zero Error.

Actual Weight Plus 0.1% Error (Pounds)	10 lb Division		50 lb Division	
	Scale Indication	Error*	Scale Indication	Error*
51 051	51 050	+50	51 050	+50
52 052	52 050	+50	52 050	+50
53 053	53 050	+50	53 050	+50
54 054	54 050	+50	54 050	+50
55 055	55 060	+60	55 050	+50
56 056	56 060	+60	56 050	+50
57 057	57 060	+60	57 050	+50
58 058	58 060	+60	58 050	+50
59 059	59 060	+60	59 050	+50
60 060	60 060	+60	60 050	+50
61 061	61 060	+60	61 050	+50
62 062	62 060	+60	62 050	+50
63 063	63 060	+60	63 050	+50
64 064	64 060	+60	64 050	+50
65 065	65 060	+60	65 050	+50
66 066	66 070	+70	66 050	+50
67 067	67 070	+70	67 050	+50
68 068	68 070	+70	68 050	+50
69 069	69 070	+70	69 050	+50
70 070	70 070	+70	70 050	+50
71 071	71 070	+70	71 050	+50
72 072	72 070	+70	72 050	+50
73 073	73 070	+70	73 050	+50
74 074	74 070	+70	74 050	+50
75 075	75 080	+80	75 100	+100
Total 3rd Quarter		+1 570	+1 300	
Total Previous Quarters		+1 270	+1 250	
Total for 3 Quarters		+2 840	+2 550	

*Error: Difference of Scale Indication from Absolute Zero Error.

Actual Weight Plus 0.1% Error (Pounds)	10 lb Division		50 lb Division	
	Scale Indication	Error*	Scale Indication	Error*
76 076	76 080	+80	76 100	+100
77 077	77 080	+80	77 100	+100
78 078	78 080	+80	78 100	+100
79 079	79 080	+80	79 100	+100
80 080	80 080	+80	80 100	+100
81 081	81 080	+80	81 100	+100
82 082	82 080	+80	82 100	+100
83 083	83 080	+80	83 100	+100
84 084	84 080	+80	84 100	+100
85 085	85 080	+80	85 100	+100
86 086	86 090	+90	86 100	+100
87 087	87 090	+90	87 100	+100
88 088	88 090	+90	88 100	+100
89 089	89 090	+90	89 100	+100
90 090	90 090	+90	90 100	+100
91 091	91 090	+90	91 100	+100
92 092	92 090	+90	92 100	+100
93 093	93 090	+90	93 100	+100
94 094	94 090	+90	94 100	+100
95 095	95 100	+100	95 100	+100
96 096	96 100	+100	96 100	+100
97 097	97 100	+100	97 100	+100
98 098	98 100	+100	98 100	+100
99 099	99 100	+100	99 100	+100
100 100	100 100	+100	100 100	+100
Total 4th Quarter		+2 210	+2 500	
Total Previous Quarters		+2 840	+2 550	
Total		+5 050	+5 050	

*Error: Difference of Scale Indications from Absolute Zero Error.

(Item 303-3 was adopted)

303-4 T.1.3. TO TESTS INVOLVING DIGITAL INDICATION OR REPRESENTATIONS

In its 1979 report the Committee expressed the view that this paragraph was appropriate when applied to printers on dial scales (i.e., digital recorded values derived from an analog indication) but that it no longer felt it was appropriate to apply it to digital indicators. Action was not recommended on the basis of the tolerance study now underway. However, since recommendations for immediate change are not being recommended, the Committee feels that this problem should be addressed now. The Committee fully recognizes the problem with determining errors on digital indicators in a hostile environment by using error weights to determine breakpoints. It does feel that this methodology should be used on pattern approval and prototype examinations in the laboratory or in a controlled environment and when results are questionable, effort should be made to use it on in-service tests in the field. When circumstances are such that the value of the error cannot be determined with assurance when using error weights to determine breakpoints the methodology should not be used. An example of a test methodology using error weights to determine the error value is as follows:

If the tolerance value is plus or minus one-half scale division and the resultant quantity indication on the application of a specific test load is plus one division of the zero error value, remove error weights equal to one-quarter division and the resultant quantity value indication should be equal to a zero error value or the device is out of tolerance. Conversely, if the quantity indication is minus one scale division, add error weights equal to one-quarter division and the device should indicate a zero error quantity value or the device is out of tolerance.

Example #1 Scale Cap: 100 000 lb x 20 lb

	<u>Test Load</u> <u>(pounds)</u>	<u>Tolerance</u> <u>(pounds)</u>	<u>Indication</u> <u>(pounds)</u>
Remove	10 000	10	10 020
5 lb (1/4 d)	9 995	10	10 000

(if 10 020 out of Tol.)

-OR-

Add	10 000	10	9 980
5 lb (1/4 d)	10 005	10	10 000

(if 9 980 out of Tol.)

Example #2 Scale Cap: 25.00 lb x .01 lb

	Test Load (pounds)	Tolerance (pounds)	Indication (pounds)
Remove	5.00	0.005	5.01
.0025 lb (1/4 d)	4.9975	0.005	5.00

(if 5.01 out of Tol.)

-OR-

Add	5.00	0.005	4.99
.0025 lb (1/4 d)	5.0025	0.005	5.00

(if 4.99 out of Tol.)

The Committee recommends that T.1.3. be amended to read:

T.1.3. TO TESTS INVOLVING DIGITAL REPRESENTATIONS - To the tolerances that would otherwise be applied, there shall be added an amount equal to one-half the minimum value that can be indicated or recorded. This does not apply to digital indications or recorded representations that have been corrected for the rounding error.

(Item 303-4 was adopted)

303-5 UR.3. USE REQUIREMENTS.

The Committee reviewed a recommendation received which suggested that the minimum load that should be allowed to be weighed on a jewellers scale is a load equal to 50 scale divisions. The Committee is also cognizant of the fact that minimum loads are specified in OIML IR #3 and are included in the table presented in item 303-3 of this report. The Committee offers the following table which illustrates the possible resultant relative weighing errors from scale division uncertainty and recommends the action that follows the table.

Load (expressed in d)	Relative Error (in percent)
10	5.00
20	2.50
30	1.67
50	1.00
100	0.50

Insert the following new user requirement, numbered appropriately:

UR. MINIMUM LOAD ON A JEWELERS SCALE.- A jewelers scale shall not be used for weighing a net load smaller than 50 scale divisions.

(Item 303-5 was tabled)

303-6 WHEEL-LOAD WEIGHERS

The Committee received several comments with respect to these devices and their use. One of these comments indicated that conflicts result when paragraph UR.4.4. Single-Draft Vehicle Weighing, is referenced by a trucker as a defense when he is charged with a gross load violation when weighed on wheel-load weighers. It is the view of the Committee that this is adequately covered by the definition of a wheel-load weigher which indicates they are only appropriate for law enforcement purposes and by paragraph UR.3.5.2. which indicates that when wheel-load weighers are used for gross load determinations, the vehicle must be in a reasonably level position. In reviewing this item, the Committee discovered that UR.4.4. is not a maintenance requirement but rather a use requirement and consequently belongs in the UR.3. Use Requirements Section. To correct this condition the Committee recommends code amendment as follows.

paragraph UR.4.4. be renumbered UR.3.5.

paragraph UR.3.5., 3.5.1. and 3.5.2. be renumbered UR.3.6., 3.6.1., and 3.6.2., respectively

The Committee also heard a presentation and a report was submitted on dynamic weighing of motor trucks for enforcement purposes. A part of this report with some editorial changes is as follows.

DYNAMIC WEIGHING OF MOTOR TRUCKS FOR ENFORCEMENT PURPOSES

OBJECTIVE: To establish in Handbook 44 a tolerance suitable for enforcement purposes which will apply to scales whether they are used statically or in motion.

THE CASE FOR A DYNAMIC WEIGHING TOLERANCE:

1. The Federal Highway Administration Publication #2 CFR, Part 657 and 658 recommends among others the use of in motion weighing as part of individual States' enforcement programs. It further states that "each State shall develop a plan for the maintenance of an effective enforcement process." There are currently no Handbook 44 regulations covering this type of scale.
2. To stick to the letter of the Federal Highway Administration requirements, the individual axle loads should be measured rather than tandem axle loads, as are usually measured. The measurement of individual axle loads statically is subject

to much potential error, due to weight distribution shifts between axles caused by starting/stopping, brakes being applied, etc. Recent tests on a multiple-section scale capable of weighing individual axle loads have shown large errors. Weighing of axle loads in motion largely eliminates these errors, and will, in general, be more accurate than static weighing, at least at low speed.

3. The ability to use existing static scales, plus new in-motion scales, would greatly increase the ability of the enforcement authorities to monitor larger volumes of traffic than is currently possible while maintaining the same accuracy as is presently obtained when using portable wheel load weighers.
4. Accuracy necessary for enforcement of overloads does not need to be as high as for buying and selling--this is already acknowledged, in effect, in Handbook 44, in paragraph T.3.9., which provides for a maintenance tolerance of 2% and an acceptance tolerance of 1%.
5. Scales used for the same purpose should have the same tolerances applied, regardless of the type of scale. In this instance, the tolerance which is regarded as suitable for enforcement for one type of scale (i.e., portable wheel weighers) should be equally applicable to other types of scales used for enforcement (i.e., in motion).

The Committee feels that dynamic weighing may be an appropriate application for law enforcement and solicits comments on performance capability, specification, and test methods for these devices prior to its next interim meeting so that the Committee may make a positive recommendation for action by the 67th NCWM.

(Item 303-6 was adopted)

303-7 GRAIN BULK WEIGHING SYSTEMS

During the past several years there have been many technological advances in measurement methods. Electronics and microprocessors, now prevalent in almost all new systems, were certainly not considered in the development of most H-44 requirements. Merchandising methods have also changed. For the most part, H-44 was directed toward mechanical equipment already produced and used in direct sale applications. However, it is not too difficult to apply the principles of the present requirements to the new technology and methods. Paragraph G-A.3. alludes to this too in that it instructs the user that for special or unclassified equipment "code requirements and provisions shall be applied with due regard to the design, intended purpose, and conditions of use of the equipment." However, this does not mean that changes need not be made, as evidenced by the actions of the Conference through the years.

Another change is that measurement devices no longer necessarily "stand alone" but rather are a part of a "measurement system." A familiar example is an electronic cash register, interfaced with a weighing element, a scanner, and a computer. Grain bulk weighing systems, lesser known to most weights and measures officials, are still another example. These systems come under the purview of State and local weights and measures jurisdictions and the Federal Grain Inspection Service (FGIS) as well. In order to provide a common understanding and to develop appropriate requirements directed to these systems, OWM has worked closely with FGIS. As a result, what follows is directed to these systems and is for use by State and local officials as applicable to all automatic bulk weighing systems, since these systems are used for determining the quantity of a variety of products including grain.

- a) No load reference - Although H-44 seems to require an indication of "zero" as a no load reference, the principle expressed is that to weigh accurately it is necessary that a readily understandable, repeatable, and effective "no load reference" be indicated and recorded. Since automatic bulk weighing systems operate by weighing repeated drafts and the net weight determination is made by calculating the difference between the no load reference values and the values obtained with an equilibrium at specific loads, it is necessary only that the no load reference meet the previously mentioned criterion. A positive value seems to meet that criterion and additionally can be more accurate since the no load reference value is automatically determined and used in the calculation after every draft. Consequently any change in the no load equilibrium condition does not require the intervention of an operator. Therefore, for this special equipment, paragraph S.1.1. Zero Indications, should be interpreted as requiring only an appropriate "no load reference" rather than a "zero" reference. Also, paragraph UR.4.1. Balance Condition, should be interpreted as requiring that the "no load" or "zero load" reference be indicated and recorded.
- b) No load reference sequence. - Since these systems are used both to "weigh in" and/or to "weigh out" the sequence in which the quantity received or quantity delivered is determined must be stipulated. When the quantity of product received is being determined it is necessary that the "no load reference value" be determined and recorded first and the "full load reference value" determined and recorded next. Thus the difference is the amount received. Conversely, when the quantity of product delivered is being determined, the sequence must be reversed; i.e., "full load reference" first, and "no load reference" next. If a system does not have this dual capability, it can be considered appropriate only for service consistent with its design.
- c) Recorded Values.- It is necessary that these systems be equipped with recording elements since it is impractical and probably impossible to manually record the correct values in such a repeated operation. Other conditions necessary are (1) an effective motion

detect system consistent with the requirements of H-44 so that the values can be recorded only when the device is in stable equilibrium; (2) the values are displayed during the printing cycle; (3) some guarantee and indication that both gates (weigh hopper and loading garner) are closed during the print cycle; (4) the system shuts down automatically when it fails to operate in accord with its design; (5) some guarantee that a final partial draft quantity is recorded; (6) in direct sale applications a complete record of all recorded values is provided the party not operating the equipment; (7) the values recorded are consistent with the requirements of G-S.5.; i.e., clear, definite and easily read under normal conditions of operation; (8) some guarantee that any test weights installed in the system cannot interfere with correct weighing; and (9) when the system is designed to transport grain through the scale without being weighed, means shall be provided to indicate clearly that this mode of operation is being utilized.

- d) Other Design Considerations. There are, of course, other design and operating characteristics that must be considered in determining the appropriateness of these systems. A check list has been developed by FGIS which is as complete as circumstances allow and this information will be included in the check list developed for the National Type Approval Task Force as soon as possible.
- e) Test Procedures. The test of this equipment must follow the principles expressed in H-112; i.e., "A precise operation based upon proven standards and so conducted as to duplicate, as nearly as practicable, service conditions of operation."

(Item 303-7 was adopted)

304

SECTION 3.30. LIQUID-MEASURING DEVICES

304-1

S.1.4.3. FOR RETAIL DEVICES/DISPLAY OF UNIT PRICE AND PRODUCT IDENTITY

The Committee received a comment that with rapidly escalating prices and the various interim measures used in the merchandising of retail motor fuel, the display of unit prices has been proliferated by the use of many varying and confusing methods. It is the view of the Committee that specifying by regulation a certain methodology only may be too restrictive; the Committee recommends that all jurisdictions enforce the following principles in the display of Unit Prices.

1. When the unit price exceeds \$0.999, the value must be identified as dollars and not cents.
2. The reference to "tenths of cents" should be a decimal fraction not a common fraction and all future designs should meet this criterion; e.g., \$1.399 not 1.39 9/10.

3. The unit price may be identified with the words "unit price," provided that when all the values normally displayed, (quantity, total price, and unit price) are observed, it is clear what the unit is; for example, gallons, liters, etc.

(Item 304-1 was adopted)

304-2 S.1.4.4. MONEY VALUE DIVISIONS ANALOG

The Committee received a recommendation that this paragraph should be amended to provide metric equivalents for \$1.00 per gallon and \$3.00 per gallon. An example given was \$1.00 per gallon or \$0.25 per liter, \$3.00 per gallon or \$0.75 per liter. The Committee recognizes the relationship between \$1.00 per gallon and \$1.00 per liter as approximately 1:3.785 and recommends S.1.4.4.1. be amended to read:

- a) not more than 1 cent at unit prices up to and including \$1.00 per gallon or \$0.25 per liter.
- b) not more than 2 cents at unit prices greater than \$1.00 per gallon or \$0.25 per liter up to and including \$3.00 per gallon or \$0.75 per liter.
- c) not more than 5 cents at unit prices greater than \$3.00 per gallon or \$0.75 per liter.

(Item 304-2 was adopted)

304-3 TWO CENT MONEY VALUE ANALOG DIVISIONS ON RETAIL MOTOR FUEL DISPENSERS

The Committee reviewed the resultant impact of 2-cent analog money value divisions and especially the impact on digital consoles indicating in 1-cent divisions. It is the view of the Committee that in those instances when the customer's indication is in 2-cent divisions, the customer should be required to pay for the total sale only in 2-cent increments. Consequently it is necessary that provision be made in the system to assure that customers will pay only the value displayed on the island dispenser to the nearest graduation.

(Item 304-3 was adopted)

304-4 S.2.5.1. ZERO-SET-BACK INTERLOCK

The Committee received a comment that most frequent fraudulent operation of retail motor fuel dispensers was avoiding the activation of the interlock and that when nozzles are stored or hung on the dispenser, it is not readily discernible that it is in its "designed hanging position." The Committee concurs and recommends that this paragraph be amended by adding the following words after "designed hanging position." "...; that is, any position where the tip of the nozzle is placed in its designed receptacle and the lock can be inserted."

Additionally, it is the view of the Committee that to insure proper interlocking when a single pump supplies product to more than one hose, the following paragraph should be added to S.2.5.1.

In a system with more than one dispenser supplied by a single pump, there shall be incorporated in each dispenser an effective automatic control valve that will prevent product being delivered by a dispenser until the indicating elements on that dispenser have been returned to a correct zero position.

(Item 304-4 was adopted)

304-5 T.2.1. TOLERANCE VALUES/ON RETAIL DEVICES

It was brought to the attention of the Committee that when the tolerance table was eliminated and paragraphs T.2.1.1. and T.2.1.2. inserted, the tolerances applicable to lubricant devices were not included. To correct this oversight the Committee recommends code amendment as follows:

T.2.1.1. FOR DEVICES INDICATING IN INCH-POUND UNITS.- The maintenance tolerance on normal and special tests, except on elapsed time tests, shall be one cubic inch plus one cubic inch per indicated gallon and never less than 2 cubic inches. The acceptance tolerance shall be 1/2 the maintenance tolerance.

T.2.1.2. FOR DEVICES INDICATING IN METRIC UNITS.- The maintenance tolerance on normal and special tests, except on elapsed time tests, shall be 20 milliliters plus 4 milliliters per indicated liter and never less than 40 milliliters. The acceptance tolerance shall be 1/2 the maintenance tolerance. The tolerance applied to a 19-liter draft shall be that tolerance applicable to a 20-liter draft. [Amended 1981]

(Item 304-5 was adopted)

304-6 SUPPRESSION OF INDICATED VALUES

The Committee was requested to respond to a question concerning the maximum indicated quantity values that could be suppressed, or not indicated on a digital retail motor fuel dispenser. The Committee had responded to this issue two years ago and established this value as 0.009 gallon or 0.03 liter. Thus the first value indicated must never be more than 0.01 gallon or 0.04 liter.

This decision was based on the following:

1. The first indication on a device indicating in 0.01 gallon divisions is 0.01 gallon, therefore, a device indicating in 0.001 gallon units should be given the same consideration.

2. The equivalent value to 0.009 gallon is 2.08 cubic inches. This is a significant amount when compared to the tolerances allowed, and allowing any larger value would make the determination of the performance of the device more difficult and would necessitate taking additional 5-gallon test drafts.
3. The suppression does not improve the measurement capability but rather the opposite and tends to cover up other problems, e.g. soft wall hoses.

(Item 304-6 was adopted)

304-7 MATHEMATICAL AGREEMENT/HIGH UNIT PRICES/READING UNCERTAINTY

The present price of retail motor fuel and anticipated increasing prices have resulted in many problems for the various segments of the petroleum industry, the manufacturers of dispensing systems, consumers, and, as always, the weights and measures official. It has become evident that the determination of the capability of a retail motor fuel dispenser equipped with analog indicating elements or a combination of analog and digital indications to accurately compute total prices with unit prices in excess of \$1.00 per gallon is a problem.

H-44 LMD Code paragraph S.1.4.4. requires computation accuracy on analog equipment to the nearest money value graduation. Thus, with 1¢ graduations, the maximum error is 0.5¢, with 2¢ graduations, 1¢, and with 5¢ graduations, 2 1/2¢. General Code Paragraph G-S.5.5. requires the computation accuracy on digital money values to the nearest 1¢, or a maximum deviation of 0.5¢.

To illustrate the magnitude of the mathematical agreement problem, and in evaluating the recommended solution there are certain aspects of the design of the mechanical computer that must be considered. These are:

1. The circumference of the rotating money and quantity discs or wheels is 10.15 inches, and the nominal width of the graduations is 0.040 inch.

2. On the wheel with 1/10 gallon divisions the rotation or travel of the wheel for each 1/10 gallon delivery is 1 inch. The following table illustrates more clearly the relationship between the travel of the wheel in inches and the quantity indicated in decimal fractions of a gallon.

Travel inches	Quantity indicated	
	gallons	cubic inches
1.000	0.100	23.1
0.100	0.010	2.31
0.010	0.001	0.231
0.040 (width of graduations)	0.004	0.924

3. On the wheels with money value divisions the following table illustrates the relationship between travel in inches and the money values indicated on the various money wheels in use:

MONEY VALUE INDICATED

Travel (in inches) money wheel	10/1¢ graduations 360° transfer		20/1¢ graduations 180° transfer		20/2¢ graduations 90° transfer	
	dollars	cents	dollars	cents	dollars	cents
1	0.01	1	0.02	2	0.04	4
1/2	0.005	1/2	0.01	1	0.02	2
1/4	0.0025	1/4	0.005	1/2	0.01	1
1/8	0.00125	1/8	0.0025	1/4	0.005	1/2
1/10	0.001	1/10	0.002	2/10	0.004	4/10
1/16	0.000625	1/16	0.00125	1/8	0.0025	1/4

4. One other fact that may be useful is that the largest gear in the variator has 72 teeth and it completes four revolutions for each gallon delivered, or one revolution per 1/4 gallon. Thus, the following information can be developed.

<u>Revolutions</u>	<u>Gallons</u>
4	1
20	5
21	5.25
37	9.25
43	10.75

<u>Revolutions</u>	<u>No. of teeth</u>	<u>Quantity per tooth</u>
1	72	1/288 (0.0034722 gallon) or 0.802 cubic inch

Consistent with this information, the following comparisons indicate that at lower unit prices, the examination and test of a retail petroleum dispenser presented no special problems.

At a unit price of 50¢ per gallon and a nominal test draft of 5 gallons, the value of the width of the quantity graduation (0.04 inch) is 0.004 gallon or 0.924 cubic inch, and in terms of money value 0.2¢. Also 0.2¢ represents 2/10 inch travel on the money wheel. Thus, if the test draft is terminated with the index of the indicator at least touching the quantity graduation, the maximum variation in the quantity deliveries is $\pm 1/2$ graduation, or ± 0.02 inch, which is equal to ± 0.002 gallon or ± 0.462 cubic inch. The delivery tolerance and the performance capability of the device can easily absorb this uncertainty. The money value equivalent for this ± 0.002 gallon is equal to 0.2¢ which is equal to 0.2 inch travel on the money wheel. The design of that computer

could easily absorb this uncertainty as well. Consequently there were no apparent real problems in determining the performance and computing capabilities if the field inspector used reasonable care in the test and reading of the equipment.

When making the same comparison at a unit price of \$3.00 with a 90° transfer wheel with 2¢ graduations, the value of the width of the quantity graduation in terms of quantity remains the same, consequently the determination of the accuracy of the delivery capability poses no further problem or increased concern. However, that quantity in terms of money value has increased 6 times and is now worth 1.2¢.

The following table illustrates these comparisons at various unit prices for the various money wheels available.

Column A - Unit price in dollars

B - Value of product in cents equal to quantity graduation width (0.040 inch, 0.004 gallons, 0.924 in³)

C - Value of money value division

D - Maximum allowable variation in cents for money value computation (1/2 division)

E - Relationship of Column D to Column B, or relationship of width of graduation to maximum allowable variation (B/D).

A	B	C	D	E
0.50	0.2¢	1¢	0.5¢	0.4
1.00	0.4¢	1¢	0.5¢	0.8
2.00	0.8¢	1¢	0.5¢	1.6
2.00	0.8¢	2¢	1.0¢	0.8
3.00	1.2¢	2¢	1.0¢	1.2
4.00	1.6¢	2¢	1.0¢	1.6
5.00	2.0¢	5¢	2.5¢	0.8

This table clearly illustrates that the width of the graduation is equal to from 0.8 to 1.6 times the maximum variation allowable per the money value computation at a unit price of \$1.00 or more.

A further problem not illustrated is the readability of the total price indicated in terms of tenths of a cent as the distance between graduations decreases. A recent study conducted by the Office of Weights and Measures clearly illustrates that there is a variation among individuals in the readability of the total quantity delivered and the total price indicated. In recognition of this condition, the OWM in the conduct of prototype examinations of this equipment is adding to the existing maximum allowable mathematical agreement error 0.1¢ (1/10¢) attributable to the reading error of the total price plus the money value equal to one-half the width of the quantity graduation attributable to the reading error of the quantity delivered. The following chart indicates these applications.

Unit Prices (Dollars)		U.P. x .002 gallon
From	to and including	Additional allowance
0	0.75	\$0.000
0.75	1.25	0.002
1.25	1.75	0.003
1.75	2.25	0.004
2.25	2.75	0.005
2.75	3.25	0.006
3.25	3.75	0.007
3.75	4.25	0.008
4.25	4.75	0.009
4.75	5.25	0.010

Thus the determination of the maximum allowable deviation for 1¢ graduations is \$0.005 or for 2¢ graduations \$0.01, plus the appropriate value from the above table, plus \$0.001.

Examples:

Graduations	U.P.	Existing Allowable Error	Plus Quantity Readability	Plus Money Readability	Maximum Permissible = Error
1¢	\$1.299	\$0.005	\$0.003	\$0.001	\$0.009
1¢	1.999	0.005	0.004	0.001	0.010
2¢	2.999	0.010	0.006	0.001	0.017

The Committee is submitting these criteria and the following test methodology to the NTATF for their evaluation.

In the meantime, jurisdictions should give consideration to this material in their evaluation of equipment.

The Committee intends to recommend appropriate code amendment for action by the 67th NCWM.

Performance Test to Determine Mathematical Agreement on an Analog or Combination Analog and Digital Retail Motor Fuel Dispenser

Reading the Quantity

In determining mathematical agreement, it is essential that the reading of the quantity or amount delivered is made as precisely as possible. To improve the readability, either of the following methods is recommended.

1) Utilizing Existing Indicator and Graduations

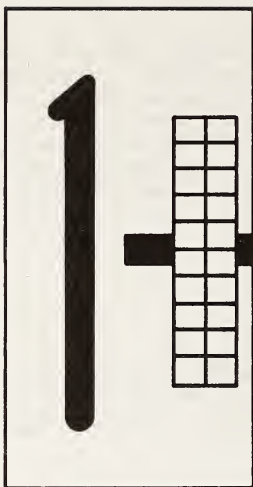
Consider each quantity value graduation to have five reference points; center, top center, top edge, bottom center, and bottom edge. Since the nominal width of the graduation is 0.04 inch and each 0.01 inch travel is equal to 0.001 gallon of delivered product, each of the reference points on either side of zero is equal to 0.001 gallon. A reading should be taken only when the index of the indicator is in coincidence with the graduation. An illustration is as follows.



Since on one side of the dispenser the wheel travels in one direction and on the other side the wheel travels in the opposite direction, the determination of the direction of travel of the wheel indicates whether the bottom edge of the graduation is +0.002 gallon or -0.002 gallon from the nominal indicated quantity.

2) Utilizing Graph Paper and a Sharply Defined Index

Graph paper with 20 squares per inch, cut into strips 0.2 inch wide and 0.5 inch long are applied with transparent tape over each 1/10 gallon graduation. One of the lines on the graph paper should be in coincidence with the center of the graduation. An indicator such as a needle held firmly in place with a clamp or magnet is installed on the face plate so that the point of the needle extends into the graph paper lines, and as close as possible to the wheel to eliminate parallax. Each square (0.05 inch) is equal to 0.005 gallon, each one fifth square is equal to 0.001 gallon. Readings are taken by estimating the indication to a fifth square. An illustration is as follows.



Readings should be taken when the index is within \pm one square of the center of the graduation.

Reading the Money Value

The reading of the money value is not as critical as the quantity reading but determinations must be made to the nearest $1/10\text{¢}$. The spacing between graduations on the various money wheels in use varies from 1 inch to $1/4$ inch. Estimating the money value to the nearest $1/10\text{¢}$ is quite easy on any of these wheels, by interpolating the position of the index of the indicator, as illustrated.



Test for Mathematical Agreement

Before conducting any tests all indices must be set properly. During the reset process the travel of the wheel varies depending on its relative position from zero at the conclusion of any delivery. Thus a reset should be made from 4 or 5 different positions; e.g. 0.2 gallon, 0.4 gallon, 0.6 gallon, and 0.8 gallon, and the best average zero position established. Throughput the testing, whenever a reset occurs, the indication is considered to be zero.

The test for mathematical agreement should consist of taking quantity and total price readings for at least 5 unit prices at the maximum full dollar range on the variator and at least 3 unit prices for other ranges. For example, if the maximum unit price setting is \$2.999, at least 3 unit prices should be tested between 0 and \$1.00, three unit prices between \$1.00 and \$2.00 and 5 unit prices between \$2.00 and \$2.999. It is desirable to use unit price settings that test all value settings in a given decade of the unit price although it is not practical to test all possible combinations. The maximum unit prices should be tested quite extensively. The emphasis of the test should be on the higher unit prices since this is where errors are most likely to occur.

Sample unit price settings are:

\$0.321	\$1.237	\$2.231
\$0.459	\$1.568	\$2.483
\$0.687	\$1.749	\$2.647
		\$2.875
		\$2.999

To collect the best data, the register should be reset before each test draft. However, this is not time efficient since a reading taken for a 15-gallon delivery and resetting the register would require delivering another 15 gallons before test data could be obtained for deliveries greater than 15 gallons.

It is suggested that three readings are to be taken before the register is reset. This method is appropriate because a register must be accurate at the final reading of a delivery and at all points between zero and the final reading. Resetting the register will reflect how the reset affects readings at various unit prices. It is useful to record the actual quantity zero setting on both sides of the register whenever the register is reset. The variation in the reset values may reflect upon the overall capability of the register or may give an insight to any non-mathematical agreement problems.

Each reading should be taken with the quantity indication set as closely as possible to the center of a graduation. It is suggested that all settings be within 0.05 inch of the center of a graduation. Quantity settings should be selected so that each 0.1 gallon graduation is tested

frequently throughout the test. The data should be examined to determine if a particular graduation indicates a consistent error.

A large number of readings are necessary to test a computing register. Deliveries for readings should range from 2 gallons to 25 gallons.

Sample Nominal Test Draft Values and Sequence

4.9
7.5
10.7

2.3
6.1
9.2

3.4
5.6
13.8

The register must be installed in a fuel dispenser for the test. The dispenser may be part of a test bench in the plant of the manufacturer or may be installed in a service station. Because of the quantity of liquid that must be dispensed, the test system may automatically circulate the delivered liquid. A large prover may be used to hold deliveries made at a service station so it is not necessary to continually empty five-gallon test measures. Since the register is being tested and not the meter in the dispenser, the accuracy of the meter is not relevant to the mathematical agreement criteria applied to the register.

Results of the test will indicate the unit price at which the money value division must be changed, if applicable.

Recording Test Data and Determining Mathematical Agreement

The following information should be recorded from each side of the register:

1. Unit price
2. Zero quantity indication to nearest 0.001 gallon (considered zero)
3. Quantity indication to nearest 0.001 gallon
4. Indicated price to nearest 0.1¢
5. Computed price rounded to nearest 0.1¢
6. Difference in the indicated price from the computed price
7. Difference between the indications on each side of the register

The total prices indicated on the two sides of the register should agree within one-half of the display money value division. The indicated total price on each side of the register must agree with the total price

computed from the unit price and quantity indications on the respective sides of the register with the allowances.

(A motion to table item 304-7 was defeated and after a short discussion this item was adopted.)

305 SECTION 3.31. VEHICLE-TANK METERS

305-1 T.2. TOLERANCE VALUES

In its last year's report (Item 304-2), the Committee indicated it was reviewing the appropriateness of the present tolerances applicable to vehicle tank meters before providing metric equivalents. The Committee also requested that comments be submitted during the ensuing year. No comments were received; however, the State of Michigan conducted a study, the results of which are as follows:

VEHICLE TANK METER SYSTEM IN-SERVICE PERFORMANCE

A special project study was made to determine the in-service performance of vehicle tank meter systems. Over 500 meter test results of many brands and sizes were tabulated. As a vast majority of the meters were of one brand, it was decided to use the data from only one brand.

The data are shown in chart form with categories of maximum meter rated capacity and with subcategories of fuel oil and gasoline. Data are shown for normal flow (maximum flow rate of system), split compartment, and slow flow tests together with the number of meters in each subcategory.

The column headed X is the mean (average) for the subcategory meters. For example, 12 fuel oil meters of 30 gal/min size delivered 100 gallons 11 cubic inches, on the average, when the meter register indicated 100 gallons. This is the accuracy of the metering system at normal flow. The column headed σ is the standard deviation. For example, the lot of fuel oil meters of 30 gal/min size represented by this sample has a standard deviation of 36 cubic inches. This represents the meter precision and indicates that 99% of the meters represented by this sample will vary no more than a total of 216 cubic inches on a 100 gallon test, 95% will vary no more than a total of 144 cubic inches, and 68% will vary no more than a total of 72 cubic inches ($\pm 36 \text{ in}^3$) on a 100 gallon test.

The same information is shown for split compartment test and slow flow test with one notable change; the values for the split compartment and slow flow tests are computed as deviations from the normal flow result and then averaged to obtain X.

The results of this study indicate a bias towards the user on both the split compartment operation and slow operation of the meter. The study also indicates that less than 5% of the meters should be outside of the tolerance of ± 75 cubic inch for a normal 100 gallon test if on the average the meter is adjusted to zero error.

METER RATED CAPACITY	PRODUCT	NORMAL FLOW		SPLIT COMPARTMENT		SLOW FLOW	NUMBER IN TEST
		X	σ	X	σ		
30 gal/min	Fuel Oil	+11 in ³	36	-29	22	-14	28
	Gasoline	- 1 in ³	43	-11	34	-24	34
60 gal/min	Fuel Oil	-18 in ³	32	-18	22	- 7	22
	Gasoline	3 in ³	33	-18	27	-24	36
100 gal/min	Fuel Oil	6 in ³	41	-15	30	- 5	31
	Gasoline	- 7 in ³	41	-11	25	-17	34
All	Fuel Oil	-10 in ³	35	-18	24	- 7	25
	Gasoline	+ 1 in ³	35	-16	27	-23	36
Total Overall		- 6 in ³	35	-17	26	-13	30
							378

NOTE: All tests were of 100 gallon deliveries; split compartment test and slow results are deviations from the normal test result; for example, if normal test result was +10 in³ and slow test result was -20 in³ the slow flow value reported above would be -30 in³, which is the deviation from the normal test result.

It is the Committee's view that this study be continued before making any final recommendation and once again requests the cooperation of the Conference.

(Item 305-1 was adopted)

305-2 "COMPUTER JUMP"

The Committee was advised that in those instances where a ticket is inserted in a meter and the zero value is printed before the pump is activated thus causing the register to advance, the resultant loss to the party to whom the product is being delivered could be substantial. The Committee recognizes the difficulty in attempting to control this situation by "design" criteria, that the concern is applicable to devices without printers, and also that it is difficult to enforce user requirements. Since paragraph UR.2.2. Ticket in Printing Device, is also a user requirement to prevent fraudulent operation by the operator, this condition can be referenced and to some extent controlled by amending the User Requirement section. The Committee recommends that UR.2.1. be amended as follows:

UR.2.1. RETURN OF INDICATING AND RECORDING ELEMENTS TO ZERO.- The primary indicating elements (visual) and the primary recording elements when these are returnable to zero, shall be returned to zero immediately before each delivery is begun and after the pump has been activated and the product to be measured has been supplied to the measuring system.

(Item 305-2 was adopted)

306 SECTION 5.50. FABRIC MEASURING DEVICES

306-1 UR.2. USE REQUIREMENTS

The Committee was advised that there are commercial wholesale fabric measuring devices in use that are so designed that a subsequent delivery can be made without returning the indicating elements to zero after an initial delivery. It is the view of the Committee that design constraints are not necessary and that a user requirement should be added as follows:

UR.2.2. RETURN OF INDICATING ELEMENTS TO ZERO.- The primary indicating elements shall be returned to zero before each measurement.

(Item 306-1 was adopted)

306-2 TOLERANCES FOR FABRIC MEASURING DEVICE FIELD TEST STANDARDS

The Committee was advised that the Conference had never adopted tolerances applicable to those field standards used in the test of these

devices as it had in the adoption of Handbooks 105-1, 105-2, and 105-3. The Committee recommends adoption of the following table which reflects the principles expressed in H-44 Section 1.11. Fundamental Considerations, paragraph 3.2. Tolerances for Standards.

Tolerances for Field Standards Used in the
Test of Fabric Measuring Devices

TOLERANCE VALUES

Interval From Zero to: (Yards)	Under Registration Values (Inches)		Over Registration Values (Inches)	
	Common Fractions	Decimal Fractions	Common Fractions	Decimal Fractions
2 or less	1/16	0.062	1/32	0.031
3 and 4	1/16	0.062	5/128	0.039
5 and 6	5/64	0.078	3/64	0.047
7 and 8	1/8	0.125	1/16	0.062
9	5/32	0.156	5/64	0.078
10 and 11	3/16	0.188	3/32	0.094
12 and 13	7/32	0.219	7/64	0.109
14 and 15	1/4	0.250	1/8	0.125
Over 15*	Add 1/64 per foot	-	Add 1/128 per foot	-

* If decimal inches are used for intervals greater than 15 yards multiply the number of yards over 15 by the common fraction referenced, add 1/4 or 1/8 inch as applicable, and then convert the result to a decimal fraction equivalent.

The maximum allowable deviation between any two successive graduations shall be 1/16 (0.062) inch.

(Item 306-2 was adopted)

307 SECTION 5.51. WIRE-AND CORDAGE-MEASURING DEVICES

307-1 N.1. TESTING MEDIUM

The Committee received two suggestions regarding this paragraph, each indicating a need for recognizing testing mediums other than those referenced in this paragraph. The Committee recognizes the problems in testing these devices and in the availability of appropriate standards that can be used effectively. The Committee recommends this paragraph be amended as indicated below, but advises the Conference that any standard used must be dimensionally stable, and that any error in the standard must be consistent with the principles expressed in Section 1.11. Fundamental Considerations, paragraph 3.2. Tolerances for Standards; i.e., never greater than 25% of the smallest tolerance applicable. Since the tolerances on wire-and cordage-measuring devices are rather large, this should not present a problem.

N.1. TESTING MEDIUM.- Wherever feasible, a wire- or cordage-measuring device shall be tested with a steel tape not less than 3/8 inch in width and at least 50 feet in length. When a device cannot be tested in this manner because of the design of the device, it shall be tested with a dimensionally stable material appropriately marked and compared at frequent periodic intervals with a steel tape in order to assure that any marked interval is not in error by more than 25% of the tolerance of the device at that particular interval.

(Item 307-1 was adopted)

308

SECTION 5.54 TAXIMETERS

308-1 T.1. TOLERANCE VALUES

The Committee received an excellently detailed and documented report on taximeter performance with a recommendation for change in tolerance values. The tolerance recommendation reflected two considerations (a) tolerance values should be equal for overregistration and under registration and (b) the tolerances applicable to time tests should be reduced. The Committee expresses its sincere compliments to the reporting jurisdiction for its professional approach and responds as follows:

With respect to the application of equal tolerance values for over-registration and underregistration, it is the Committee's view that the tolerances presently in effect are appropriate for a number of reasons. The principal reason is that the customer always pays in advance for the entire portion of the time or distance included in any "money drop" whether or not all of the time is consumed or all of the distance is travelled. In the case of equal tolerances a situation could result where a taximeter was in tolerance, but in error at the tolerance limit on overregistration; consequently the customer could be charged for another drop before receiving full measure for this interval already registered on the meter. Further, most of the variables involved in the measurement process tend to favor the operator.

With respect to the recommended tolerance reduction on time intervals, it is the view of the Committee that the material submitted was too limited a data base and that more information is needed. The Committee also reviewed the OIML International Recommendation and found that the values presented in that document are even greater than those presently in H-44. The Committee requests that all interested and affected Conference participants communicate their views with supporting data during the ensuing year.

(Item 308-1 was defeated)

309-1 H-44 FORMAT

The Committee received several comments on the new format of H-44. On the basis of these comments the Committee offers the following recommendations.

- a) Enter page number for each code on each of the five Sectional frontal pages.
- b) Use year Handbook is effective rather than the year adopted by the Conference.

Several printing errors were brought to the attention of the Committee and these will be corrected in the next edition.

(Item 309-1 was adopted)

309-2 OIML REPORT

The Committee has been extremely active with respect to OIML during the last several years. As a result, wherever possible the Committee has recommended changes to H-44 that will make it technically consistent with existing OIML IR's. A principal consideration in scale code recommended changes and studies being conducted are IR #3 and IR #28. Over the ensuing year, comparisons will be made of existing or draft OIML IR's and H-44 Codes on Length Measuring devices including fabric- and wire- and cordage-measuring devices, taximeters, and odometers. Similar activity is anticipated for Liquid-Measuring Devices, and Belt-Conveyor Scales.

A brief report of the year's activities of the Specifications and Tolerances Committee on OIML work is as follows.

International Recommendations or Documents Reviewed

- IR 3 - 2nd and 3rd draft revisions
- IR 28 - 2nd draft revision
- IR 5 - draft revision
- Draft IR on supplementary devices for measuring systems
equipped with meters
- Draft IR on Length Measuring Devices
- Draft IR on Length Measures

Meetings Attended

- PS 7/RS 4 Non Automatic Weighing Machines
- PS 5/RS 13 Volume Measures
- 6th International Conference

What follows is a list of OIML IR's impacting on Weights and Measures administration in the United States. Those interested in receiving a copy of any of these should send their requests to the Office of Weights and Measures or the Office of Domestic and International Measurement Standards, National Bureau of Standards, Washington, DC 20234.

<u>IR No.</u>	<u>Title</u>
1	Cylindrical Weights of Medium Accuracy Class
2	Rectangular Bar Weights of Medium Accuracy Class
3	Metrological Regulations for Non-automatic Weighting Machines
4	Volumetric Flasks (one mark) in Glass
5	Meters for Liquids Other Than Water with Measuring Chambers
6	General Prescriptions for Volumetric Gas Meters
7	Clinical Thermometers (mercury-in-glass, with maximum device)
8	Standard Checking Method of Humidimeters for Cereals
15	Instruments for Measuring the Hectolitre Weight of Cereals
20	Weights of Accuracy Classes E ₁ E ₂ F ₁ F ₂ M ₁
21	Taximeters
24	Rigid Standard Metre for Verification Agents
25	Standard Weights for Verification Agents
27	Meters for Liquids Other Than Water; Supplementary Devices
28	Technical Regulations of Non-automatic Weighing Machines
29	Serving Measures of Capacity
31	Gas Meters with Deformable Walls
32	Gas Meters with Rotating Pistons and Turbine Gas Meters
33	Conventional Value of the Results of Weighing in Air
34	Classes of Accuracy of Measuring Instruments
35	Material Measures of Length
40	Graduated Standard Pipettes for Verification Agents
41	Standard Burettes for Verification Agents
42	Metal Stamps for Verification Agents
43	Standard Graduated Glass Flasks for Verification Agents
46	Active Electrical Energy Meters for Direct Connexion
47	Standard Weights for Testing of High Capacity Weighing Machines
49	Water Meters Intended for the Measurement of Cold Water

(Item 309-2 was adopted)

309-3 GRAIN MOISTURE METERS

Prior to and during the interim meetings the Task Force on Grain Moisture Measurement met repeatedly and at length. As a result the Task Force submits the draft tentative code that follows this report for study and review by the Conference.

This draft is intended to permit the use of most types of grain moisture meters presently used in commerce. However, the Task Force goes on record strongly advocating automatic devices. The Task Force encourages the incorporation of temperature sensing equipment, grain sample quantity measurement equipment, and direct readout mechanisms into the meters in order to reduce the potential for misuse or fraud.

The Task Force is cognizant of the fact that the standards used in the testing of grain moisture meters may not meet the criterion expressed in H-44 Section 1.11. Fundamental Considerations, Paragraph 3.2. Tolerances for Standards; i.e., the error in the standard shall not be greater than 25% of the tolerance to be applied when the standard is used.

The proposed tolerances are based on actual data; the acceptance tolerances are based on laboratory performance tests and the maintenance tolerances on field performance tests. Laboratory data were collected on a few meters of each brand and model. Field data were collected on all the commercial meters used in 9 States. (Information was not available on the condition of these meters in use; i.e., new or recently serviced) The Task Force would greatly appreciate additional information on the results of tests on newly installed devices to aid in determining the overall appropriateness of the proposed acceptance tolerances.

Specific comments are also solicited on paragraph UR.3.6. Sampling, in order to specify standard sampling techniques.

Finally, the Task Force urges all interested parties to forward comments to it on the draft as a whole as soon and as completely as possible (Mail comments to Task Force on Grain Moisture Meters, c/o OWM, National Bureau of Standards, Washington, DC 20234).

(Item 309-3 was adopted)

309-4 OWM REPORTS OF TEST

For the convenience of the Conference, the Committee will include in its annual report to the Conference a list of the Reports of Test for prototype examinations that have been issued by OWM since the last Conference.

This first tabulation begins January 1980 and includes all Reports issued from that data in numerical order.

Users are advised to refer to the actual Report of Test to ascertain the scope of the Report with respect to options available including varying capacities, and additional models.

(Item 309-4 was adopted)

1980

OWM REPORT OF TEST

Number	Date	Company	Model	Equipment Description	Capacity	n
493	1/23/80	Masstron Scale, Inc.	Truckmate	Pitless Vehicle Scale	200 000 lb	10 000
494	2/7/80	Intercomp Company	AM-4660	Indicating Element & Printer	50 000 lb	
495	1/30/80	Flex-Weigh Corporation	DWM-1	Indicating Element	400 lb	4 000
496	2/1/80	Flex-Weigh Corporation	PGB-1818	Weighing Element	100 lb	5 000
497	2/12/80	MCR Corporation	2125-1502	Cash Register	30 lb	3 000
498*	2/27/80	Veeder Root	2002E	Retail Petrol. Disp. Computer	999.9 gal	
499	3/12/80	National Controls, Inc.	3275-15	Computing Scale	15 kg	3 000
500	4/1/80	Metro Equipment Corp.	AC-1616	Weighing Element	150 lb	3 000
501	4/1/80	Weigh-Tronix	PMTX	Vehicle Scale Weighing Element	120 000 lb	6 000
502	5/1/80	Fairbanks Weighing Div.	3002	Indicating Element	160 000 lb	8 000
503	5/19/80	Fairbanks Weighing Div.	90-8811	Indicating Element	400 000 lb	20 000
504	5/19/80	Fairbanks Weighing Div.	90-8810	Indicating Element	400 000 lb	20 000
505	5/19/80	Sooner Scale, Inc.	PS-18-65-13	Portable Livestock Scale	13 000 lb	2 600
506	5/19/80	Delta System, Inc.	80-700	Cash Register	30 lb	3 000
507	6/10/80	Maverick Engineering	110	Digital Electronic		
508	6/10/80	New Brunswick Intl. Inc.	DS-120	Computing Scale	30 lb	3 000
509	6/23/80	Detecto Scales Co.	5000	Indicating Element	50 lb	5 000
510	6/23/80	Control Systems, Inc.	475-1	Bulkweighing System Controller	40 000 lb	8 000
511	6/23/80	Cargill, Inc.	475-1	Bulkweighing System Controller	40 000 lb	8 000
512	8/22/80	Carcom, Ltd.	700	Indicating Element	50 lb	10 000
513	8/22/80	Carcom, Ltd.	1080	Weighing Element	80 lb	2 000
514	9/10/80	Lockheed Electronics Co.	900	Comput. Indic. & Record. Ele.		
515	8/22/80	Unidynamics/St. Louis	Series 85	Computing Indicating Element		
516	7/15/80	Fairbanks Weighing Div.	90-151	Indicating Element	160 000 lb	8 000
517	9/10/80	Fairbanks Weighing Div.	8830	Indicat. Element & Controller	400 000 lb	20 000
518	9/10/80	Electroscale Corp.	330	Printer		
519	9/10/80	Electroscale Corp.	Slimline	Weighing Element	3000 lb	6 000
520	9/18/80	TEC America, Inc.	MA 190-30	Electronic Cash Register	30 lb	3 000

* Addendum dated 9/17/80

n - number of scale divisions

1980

OWN REPORT OF TEST

Number	Date	Company	Model	Equipment Description	Capacity	n
521	9/10/80	TEC America, Inc.	SL 43-30	Weighing Element	30 lb	3 000
522*	9/29/80	NCR Corporation	2140-1732	Point-of-Sale System	30 lb	3 000
523	9/17/80	Veeder Root	VR312020-595	Modification Kit	\$3.999 gal	
524	10/24/80	Sweda Intl., Inc.	5610	Electronic Cash Register	30 lb	3 000
525	12/4/80	Fairbanks Weighing Div.	50-3800	Ticket Printer		
526	12/4/80	Fairbanks Weighing Div.	50-3702	Tape Printer		
527	11/24/80	Measuregraph Company	481	Fabric Measuring Device		799
528	12/4/80	Astec Industries, Inc.	LPS-70	Self-contained Vehicle Scale	100 000 lb	5 000
529	3/10/81	Electroscale Corporation	533	Indicating Element	240 lb	12 000
530	3/10/81	Sciencetech, Inc.	SE 300	Jewelers Scale	300 g	30 000
531**	3/10/81	M.S. Industries, Inc.	200	Fabric Measuring Device		35 999
532	2/10/81	Berkel Incorporated	560	Computing Counter Scale	160 oz	3 200
533	5/5/81	Petrol. Meter & Pump Co.	679-338	Metric Gear Box Conversion Kit		
534	2/3/81	John Chatillon & Sons	PBB 135	Portable Bench Beam Scale	135 lb	
535	3/10/81	Mettler Instrument Corp.	RP 3000x3	Jewelers Scale	3 700 g	37 000
536	3/10/81	Electronic Scale Intl.	JK801/aa	Computing Scale	30 lb	3 000
537	3/10/81	Fairbanks Weighing Div.	70-4050-1	Bench Scale	100 lb	5 000
538	3/10/81	Jay Corporation	625	Electronic Cash Register	30 lb	3 000
539	3/10/81	TEC America, Inc.	M800-GRUS-AF03AR	Electronic Cash Register	30 lb	3 000
540	6/11/81	Koppens Auto. U.S.A.	E.P.S.	Retail Motor Fuel Disp. System	999.00 gal	
541	4/3/81	Consolidated Controls	UMC 2000	Indicating Element	120 lb	12 000
542	5/5/81	Weigh-Tronix	BS1818	Weighing Element	50 lb	5 000
543	5/5/81	Weigh-Tronix	WT-110	Indicating Element	50 lb	5 000
544	5/5/81	Sooner Scale, Inc.	PS-7030-A	Self-contained Vehicle Scale	120 000 lb	6 000
545	5/5/81	Metro Equipment Corp.	AF-2424	Weighing Element	1 000 lb	5 000
546	5/5/81	Metro Equipment Corp.	ACS-1611	Counter Scale	60 kg	3 000
547	5/5/81	Metro Equipment Corp.	AC-2020	Weighing Element	150 lb	3 000
548	5/5/81	Metro Equipment Corp.	AC-1616	Weighing Element	1 000 lb	10 000

* Revised 6/19/81

**Revised page 4

DRAFT FOR REVIEW AND COMMENT ONLY

SECTION 5.56. TENTATIVE CODE
GRAIN MOISTURE METERS

A. APPLICATION

A.1.- This code applies to grain moisture meters; that is, devices used to indicate directly or through conversion and/or correction tables the moisture content of cereal grain and oil seeds. The code consists of general requirements applicable to all moisture meters and specific requirements applicable only to certain types of moisture meters.

A.2.- This code does not apply to devices used for in-motion measurement of grain moisture content or seed moisture content.

A.3.- See also General Code requirements.

S. SPECIFICATIONS

S.1. DESIGN OF INDICATING AND RECORDING ELEMENTS AND OF RECORDED REPRESENTATIONS.

S.1.1. PRIMARY ELEMENTS

S.1.1.1. GENERAL.- A meter shall be equipped with a primary indicating element and may also be equipped with a primary recording element. If the meter indicates directly and/or is equipped to record, the meter shall indicate and/or record its measurements in terms of percent moisture content, wet basis. Fractional parts of this unit shall be in terms of decimal subdivisions. If the meter indicates in the conventional scale and therefore requires conversion or correction tables, the resulting values after use of such tables shall be in terms of percent moisture content, wet basis. Fractional parts of this unit shall be in terms of decimal subdivisions.

S.1.2. GRADUATIONS

S.1.2.1. LENGTH.- Graduations shall be so varied in length that they may be conveniently read.

S.1.2.2. WIDTH.- In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations, and the width of the main graduations shall be not more than 50 percent greater than the width of subordinate graduations. Graduations shall in no case be less than 0.008 inch in width.

S.1.2.3. CLEAR INTERVAL BETWEEN GRADUATIONS.- The clear interval shall be not less than 0.03 inch between graduations. If the graduations are not parallel, the measurement shall be made

- a) along the line of relative movement between the graduations and the end of the indicator, or
- b) if the indicator is continuous, at the point of widest separation of the graduations.

S.1.3. INDICATIONS

S.1.3.1. SYMMETRY.- The index of an indicator shall be symmetrical with respect to the graduations with which it is associated and at least throughout that portion of its length that is associated with the graduations.

S.1.3.2. LENGTH.- The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 0.04 inch.

S.1.3.3. WIDTH.- The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than

- (a) the width of the widest graduation,
- (b) the width of the minimum clear interval between graduations.

When the index of an indicator extends along the entire length of a graduation, that portion of the index of the indicator that may be brought into coincidence with the graduation shall be of the same width throughout the length of the index that coincides with the graduation.

S.1.3.4. CLEARANCE.- The clearance between the index of an indicator and the graduations shall in no case be more than 0.06 inch.

S.1.3.5. PARALLAX.- Parallax effects shall be reduced to the practicable minimum.

S.1.4. DIGITAL INDICATIONS

S.1.4.1. MEASUREMENT COMPLETION.- A digital indicating element shall not display any values (either moisture content or conventional scale) before the end of the measurement cycle.

S.1.4.2. RANGE OF MOISTURE CONTENT.- A digital indicating element shall not display any values when the moisture content of the grain sample is beyond the operating range of the device.

S.1.4.3. TEST WEIGHT PER BUSHEL.- If the test weight per bushel is indicated, it shall meet the volumetric requirements as specified in the U.S. Department of Agriculture GR Notice 895, dated 11/10/69, and applicable portions of the scale code.

S.1.5. RECORDING ELEMENTS

S.1.5.1. If a meter is equipped with a recording element, it shall record in terms of percent moisture content, wet basis only, and not in terms of a conventional scale.

S.1.5.2. MEASUREMENT COMPLETION.- A recording element shall not record any values before the end of the measurement cycle.

S.1.5.3. RANGE OF MOISTURE CONTENT.- A recording element shall not record any values when the moisture content of the grain sample is beyond the operating range of the device.

S.1.5.4. TEST WEIGHT PER BUSHEL.- If the test weight per bushel is recorded, it shall meet the volumetric requirements as specified in U.S. Department of Agriculture GR Notice 895, dated 11/10/69, and applicable portions of the scale code.

S.2. DESIGN OF ZERO-SETTING AND TEST POINT MECHANISMS.

S.2.1. If a grain moisture meter is equipped with a zero setting and/or test point mechanism(s), this (these) mechanism(s) shall be adjustable only with a tool outside of and entirely separate from this mechanism or enclosed in a cabinet. This requirement does not apply to manipulations that the operator must make (following operating instructions) in order to obtain a meter reading on a grain sample.

S.2.2. PROVISION FOR SEALING.- Provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to the zero setting or test point mechanism(s).

S.3. DESIGN OF DIRECT READING GRAIN MOISTURE METERS

S.3.1. GRAIN OR SEED KIND SELECTION AND RECORDING.- Provision shall be made for selecting and recording, if equipped to record, the kind of grain or seed to be measured. The means to select the kind of grain or seed shall be readily visible and the kind of grain or seed selected shall be clearly and definitely identified in letters (such as WHEAT or WHT, etc.).

S.3.2. OPERATING RANGE.- Provision shall be made for indicating when the operating range of the moisture meter has been exceeded.

S.4. ACCESSORY EQUIPMENT

When the operating instructions for a moisture meter require accessory equipment separate from and external to the moisture meter, such equipment shall be appropriate and complete for the measurement.

S.4.1. GRAIN-TEST SCALE.- If the moisture meter requires weighing of the grain sample, the weighing device shall meet the requirements of the General Code and those applicable portions of the Scale Code.

S.4.2. THERMOMETERS OR OTHER TEMPERATURE SENSING EQUIPMENT

S.4.2.1. A thermometer or other temperature sensing equipment, if the moisture meter reading requires temperature correction on a device external to the moisture meter, shall be accurate to within 2 °F (1 °C) and shall display or be graduated in 2 °F (1 °C) divisions. A liquid in glass thermometer should have graduations etched on the stem.

S.4.2.2. The temperature sensing equipment or thermometer shall be designed so as to be in direct contact with a grain sample in a closed container. For example, a thermometer inserted through a small hole in the lid of the container used to hold the grain sample is acceptable.

S.4.3. TEST WEIGHT PER BUSHEL APPARATUS.- Test weight per bushel apparatus, if a moisture meter reading requires test weight per bushel correction on a device external to the moisture meter, shall meet the volumetric requirements as specified in U. S. Department of Agriculture GR Notice 895, dated 11/10/69, and applicable portions of the scale code.

S.4.4. CONVERSION AND CORRECTION TABLES.- Conversion and correction tables, charts, graphs, slide rules, or other apparatus to convert the conventional scale values read from a moisture meter to moisture content values, if such apparatus is required, shall be appropriate and correct for the moisture meter being used and shall be marked with the name and address or trademark of the manufacturer, the pattern or design of device it is intended to accompany, date of issue, the kind of grain or seed to be measured, and the range of moisture content, grain or seed temperature, moisture meter temperature, and other environmental conditions, if any, under which the moisture meter is to be used, including but not limited to electromagnetic interference and voltage and frequency ranges.

S.4.5. OPERATING INSTRUCTIONS.- Operating instruction shall include the name and address of the manufacturer, the pattern or design of device it is intended to describe, date of issue, the kind of grain or seed to be measured, and the range of moisture content, grain or seed temperature, moisture meter temperature, and other environmental conditions, if any, under which the moisture meter is to be used, including but not limited to electromagnetic interference and voltage and frequency ranges.

S.5. MARKING REQUIREMENTS.- In addition to General Code requirements, the kinds of grain and the operating range of moisture content for each kind of grain and seed shall be printed on the operating instructions of the device.

N. NOTES

N.1. TESTING PROCEDURES

N.1.1. TRANSFER STANDARDS*.- Official grain samples shall be used as the official transfer standard with moisture content values assigned with respect to the reference method. Tolerances shall be applied to the average of at least three measurements on each official grain sample. Official grain samples should be representative of the grain grown in the State, clean, and naturally moist (not artificially wet up).

N.1.2. MINIMUM TEST.- As a minimum test, moisture meters shall be tested within the operating ranges and for the kinds of grain or seed that are most often measured with the device.

N.1.3. ACCESSORY TEMPERATURE MEASURING EQUIPMENT.- The accuracy of accessory temperature measuring equipment shall be determined by comparison with a calibrated laboratory thermometer or its equivalent at two temperatures, not to exceed the range of temperature identified in the moisture meter operating instructions.

T. TOLERANCES*

T.1. TO-UNDERREGISTRATION AND TO OVERREGISTRATION.- The tolerances hereinafter prescribed shall be applied to errors of underregistration and errors of overregistration.

T.2. TOLERANCE VALUES.- Maintenance and acceptance tolerances shall be as shown in Table 1. Tolerances are expressed as a fraction of the percent moisture content of the official grain sample, together with a minimum tolerance.

* These tolerances do not apply to tests in which grain moisture meters are the transfer standards.

TABLE 1.- TOLERANCES FOR GRAIN MOISTURE METERS

ACCEPTANCE TOLERANCES		
Type of grain or seed	Tolerance	Minimum Acceptance Tolerance
Cereal grains except corn and rice	0.03 of the percent moisture content	0.5 percent in moisture content
Corn, rice, sorghum, sunflower	0.04 of the percent moisture content	0.6 percent in moisture content
Safflower and soybeans	0.03 of the percent moisture content	0.5 percent in moisture content

MAINTENANCE TOLERANCES		
Type of grain or seed	Tolerance	Minimum Maintenance Tolerance
Cereal grains except corn and rice	0.04 of the percent moisture content	0.7 percent in moisture content
Corn, rice, sorghum, sunflower	0.05 of the percent moisture content	0.8 percent in moisture content
Safflower and soybeans	0.04 of the percent moisture content	0.7 percent in moisture content

UR. USER REQUIREMENTS

UR.1. SELECTION REQUIREMENTS

UR.1.1. VALUE OF THE SMALLEST UNIT ON PRIMARY INDICATING AND RECORDING ELEMENTS.- The value of the smallest unit on a moisture meter, whether the moisture meter reads directly in terms of moisture content or when the conventional scale unit is converted or corrected to moisture content, shall be less than or equal to one-half of the minimum acceptance tolerances.

UR.1.2. See also G-UR.1.2.

UR.2. INSTALLATION REQUIREMENTS

The grain moisture meter shall be installed in an environment within the range of temperature and/or other environmental factors specified in the operating manual and on the conversion or correction tables if such tables are necessary for the operation of the device.

UR.3. USE REQUIREMENTS

UR.3.1. OPERATING INSTRUCTIONS.- There shall be posted or displayed the operating instructions for the use of a grain moisture meter; they shall include a list of accessory equipment, conversion and correction charts, if any are required to obtain moisture content values, and the kinds of grain or seed to be measured with the moisture meter.

UR.3.2. OTHER DEVICES NOT USED FOR COMMERCIAL MEASUREMENT.-If there are other moisture meters on the premises not used for trade or determining other charges for services, these devices shall be clearly and conspicuously marked "Not for Use in Trade or Commerce."

UR.3.3. MAINTAINING INTEGRITY OF GRAIN SAMPLES.- Whenever there is a time lapse (temperature change) between taking the sample and testing the sample, means to prevent condensation of moisture or loss of moisture from grain samples shall be used. For example, a cold grain sample may be kept in a closed container in order to permit the cold grain to come to the operating temperature range of the meter before the grain moisture measurements are made.

UR.3.4. PRINTED TICKETS.- Printed tickets, if the meter is so equipped, shall be free from any previous indication of moisture content or type of grain or seed selected.

UR.3.5. ACCESSORY DEVICES.- Accessory devices, if necessary in the determination of a moisture content value, shall be in close proximity to the moisture meter and allow immediate use.

UR.3.6. SAMPLING.- The grain sample shall be obtained by following appropriate sampling methods and equipment. These include, but are not limited to grain probes of appropriate length used at random locations in the bulk, the use of a pelican sampler, or other techniques and equipment giving equivalent results. The grain sample shall be taken such that it is representative of the lot.

UR.3.7. LOCATION.- See G-UR.3.3.

DEFINITION OF TERMS

CALIBRATED LABORATORY THERMOMETER: A thermometer with ± 2 °F (± 1 °C) tolerance in the range -30 to 120 °F (-35 to +50 °C) with 1 °F (1 °C) divisions and intercompared with thermometer of ± 0.5 °C tolerance.

CEREAL GRAIN AND OIL SEEDS: Agricultural commodities including, but not exclusive to, corn, wheat, oats, barley, rice, sorghum, soybeans, peanuts, dry beans, safflower, sunflower, etc.

CONVENTIONAL SCALE: If the use of conversion tables is necessary to obtain a moisture content value, the moisture meter indicating scale is called "conventional scale." The values indicated by the scale are dimensionless.

CONVERSION TABLE: Any table, graph, slide rule, or other external device used to determine the moisture content from the value indicated by the moisture meter.

CORRECTION TABLE: Any table, graph, slide rule, or other external device used to determine the moisture content from the value indicated by the moisture meter when the indicated value is altered by a parameter not automatically corrected for in the moisture meter (for example, temperature or test weight).

GRAIN MOISTURE METER: Device indicating either directly or through conversion tables and/or correction tables the moisture content of cereal grains and oil seeds. Also termed "moisture meter."

GRAIN SAMPLE: That portion of grain or seed taken from a bulk of grain or seed to be bought or sold and used to determine the moisture content of the bulk.

GRAIN-TEST SCALE: See Scale Code, Definition of Terms.

KIND OF GRAIN: Corn as distinguished from soybeans as distinguished from wheat, etc.

MOISTURE CONTENT (WET BASIS): The mass of water in a grain or seed sample (determined by the reference method) divided by the mass of the grain or seed sample expressed as a percentage (%).

OFFICIAL GRAIN SAMPLES: Grain or seed used by the official as the official transfer standard from the reference standard method to test the accuracy and precision of grain moisture meters.

REFERENCE METHOD: The oven drying methods as specified in U.S. Department of Agriculture GR Notice 1211, dated 11/15/71.

The Committee expresses its appreciation to all who have contributed to and participated in the development of this report. The Committee urges all interested parties to promptly respond on matters of concern. It is only through this cooperative effort that the Conference can continue to attain uniform and equitable measurement standards.

F. C. NAGELE, Michigan, Acting Chairman
G. L. DELANO, Montana, Chairman (ABSENT)
S. A. COLBROOK, Illinois
L. H. DEGRANGE, Maryland
D. A. GUENSLER, California
O. K. WARNLOF, Technical Advisor, NBS
H. F. WOLLIN, Executive Secretary, NCWM

Committee On Specifications and Tolerances

(On motion by the committee acting chairman, the report of the Committee on Specifications and Tolerances voting key items 300 through 309-4 was adopted in its entirety as amended by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

VOTING RESULTS--Committee on Specifications and Tolerances

Voting Key	<u>House of State Representatives</u>		<u>House of Delegates</u>	
	Yes	No	Yes	No
*	37	1	52	13
301	44	0	62	0
302-1	41	3	53	11
302-2 T	21	20	51	17
302-2	8	30	12	59
303-1	44	0	64	2
303-2	43	0	66	1
303-3	39	5	56	5
303-4	38	0	68	0
303-5 T	30	13	57	13
303-6	44	0	68	0
303-7	41	0	57	0
304-1	40	0	70	1
304-2	44	0	69	1
304-3	39	2	47	4
304-4	37	0	69	0
304-5	39	0	67	0
304-6	38	0	65	0
304-7 T	3	35	39	20
304-7	37	1	45	19
305-1)				
305-2)				
306-1)	38	0	63	0
306-2)				
307-1)				
308-1	25	8	36	11
309-1)				
309-2)	42	0	60	0
309-3)				
309-4	43	0	61	0

* = Motion to debate new items 304-6, 304-7, and 309-4.

T = Motion to table.

REPORT OF THE
COMMITTEE ON EDUCATION, ADMINISTRATION,
AND CONSUMER AFFAIRS

Presented by STAN J. DARSEY, Chief,
Bureau of Weights and Measures, State of Florida

(Thursday, July 16, 1981)

VOTING KEY

400

INTRODUCTION

The committee on Education, Administration, and Consumer Affairs presents its final report to the 66th National Conference on Weights and Measures. The report consists of the tentative report as offered in the Conference Announcement, and as amended by the final report. The report represents recommendations of the committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the committee.

401

NATIONAL WEIGHTS AND MEASURES WEEK

One of the important responsibilities of the Committee is the coordinating of National Weights and Measures Week each year. Mr. Al Christie of South Dakota, who served as National Chairman for the 1981 Week, is sincerely commended by the Committee for his very successful effort to secure promotional materials and for his overall effort to make the Week a success.

The Committee regrets to report that after four years of intensive efforts by the Committee and others, Senate joint resolution #148 providing for a Presidential proclamation for National Weights and Measures Week recently died in Committee due to a lack of the necessary Congressional support. We were advised by Senator Mathias that only one other Senator expressed support for the resolution. Due to the lack of Congressional support at this time, the Committee has decided to shelve this item temporarily and pursue other areas of national publicity.

The Committee would like to personally thank Dick Hurley of Fairbanks Weighing Division of Colt Industries, Tom Stabler of Toledo Scale, Fred Katterheinrich of Hobart Corporation, and Ray Lloyd of Scale Manufacturers Association, not only for their individual efforts and help, but also for the excellent promotional materials they provided for all of the coordinators for the Week.

Consistent with its desire to assure the continuity and success of Weights and Measures Week, the Committee is very happy to announce that Mr. Tom Geiler, Hyannis, Massachusetts, has very graciously accepted

the chairmanship for National Weights and Measures Week for the year 1982.

(Item 401 was adopted)

402

PROMOTIONAL ACTIVITIES

Approximately twenty-five remaining Conference membership plaques were offered for sale at \$5.00 each during the 66th Conference in St. Louis, Missouri. Since the announcement of the new membership plan, a greater interest in obtaining the plaques has become evident.

(Item 402 was adopted)

403

NATIONAL TRAINING PROGRAM

The Committee feels that there is an immediate need for professional training in weights and measures and recognizes that the industry, education, and government sectors have begun to respond to that need.

To assure an effective national development of the training program the Committee feels that the program should be monitored, and advice and assistance given, to lessen the possibility of duplication of efforts, to concentrate efforts in priority areas, and to identify the resources available.

The Committee plans to work with several groups in the development of a national weights and measures training program and to report the progress of each to the Conference on an annual basis.

To keep jurisdictions abreast of training resources the Committee plans to work with the appointed training coordinator of each jurisdiction. To date only 21 States have appointed training coordinators. It is essential that the Committee have coordinators from all jurisdictions available to work with; it urges all jurisdictions that have not already done so to appoint training coordinators.

The Committee has set as a major goal the establishment of a "national" training program which will be:

1. Developed by and delivered by professional educators;
2. Modular so as to provide flexibility in tailoring to needs of non-homogeneous student populations;
3. Available primarily to all weights and measures officials or staff in State, county, or municipal organizations;
4. Available secondarily to associated individuals in Federal agencies, business, and industry;

5. Permanent in nature, being updated as technology, or laws and regulations evolve, and;
6. Geared to encourage and enable weights and measures jurisdictions to establish minimum entrance requirements for new employees and continuing education for current staff members.

403-1 OWM TRAINING PROGRAM

OWM reported to the Committee that 30 separate training seminars were conducted in 1980; these included 20 general weights and measures seminars, 3 specialized device seminars, and 7 laboratory metrologist seminars. Work is continuing with eight well established regional groups representing about half of the fifty States and plans are underway to establish at least three more regional groups during 1981. Industry support in providing instructors in specific areas continues to be outstanding and participation of local service officials in the seminars is also increasing.

403-2 TEXAS A & M EXTENSION SERVICE PROGRAM

A major effort to expand training opportunities in the field of Weights and Measures is currently underway through the auspices of the National Bureau of Standards, Office of Weights and Measures. This effort has culminated in a Seminar/Workshop co-sponsored by the NBS and the Texas Engineering Extension Service (TEEX) on the campus of the Texas A & M University at College Station on January 12 and 13, 1981. That Seminar/Workshop was supported by:

The National Conference on Weights and Measures (NCWM)
The National Scalesmen's Association, Texas Division (NSMA)
The National Conference of Standards Laboratories (NCSL)

The Seminar/Workshop consisted of the plenary sessions and the following five concurrent workshops:

1. Government Regulatory Officials
2. Measurement Laboratories
3. The Weighing Industry
4. The Measuring Industry, and
5. The Food Processing and Packaging Industry

The purpose of the Seminar/Workshop and consequently of each of the five workshops was to encourage the participants to identify the training necessary to establish uniform skills and to subsequently maintain or upgrade those skills. The experiences of 83 registered participants will be reported in published proceedings and serve as the basis to design a program and an associated plan designed to attain establishment and operation of that program.

As the plan and program are developed, this committee will operate as a review body and provide comments and guidance to OWM and TEEEX. The Texas A & M Extension Service developed one training module as a result of the Seminar/Workshop and field work with Texas and Louisiana State inspectors; Dr. Lloyd Fite, Head of the Electronics Training Division, presented the training module in three sessions during the Conference week.

In a presentation to the Conference, Dr. Lee J. Phillips, Assistant Director of Engineering, Engineering Extension Service, told the membership that in conjunction with OWM, TEEEX developed a "need statement" and presented it to Congressman Phil Gramm of Texas, outlining the need, an implementation plan, and a five-year budget that would support the development and implementation of a national training effort. As a result, legislation to fund the first two years of training has been prepared and will be introduced in the U.S. House of Representatives.

The Committee recognizes the urgent need for a National Training Program of this type, and applauds the efforts of TEEEX and OWM for the effort expended in developing this program. We solicit enthusiastic support of the Conference membership.

403-3 THE INSTITUTE FOR WEIGHTS AND MEASURES

The Institute for Weights and Measures has been established as a nonprofit educational institution incorporated in the State of Ohio.

During the dedication seminar for the Institute, held at Ohio State University on November 14 and 15, 1980, the need for additional educational opportunities for both weights and measures and industry officials was discussed at length in a meeting of high level Government and industry officials. Committee member Joe Swanson, Office of Weights and Measures Chief Albert Tholen, and Technical Assistant Dick Smith were present at this meeting.

It was suggested during the meeting that coordination of the many activities that were developing related to training would be necessary and further that the Committee on Education, Administration, and Consumer Affairs would be the logical group to handle this.

The Committee applauds the efforts of the Institute of Weights and Measures and welcomes this additional training resource.

The Committee explored the idea of establishing a subcommittee to act as a vehicle through which it could monitor training efforts throughout the United States. At the same time it received a request from the Institute for Weights and Measures to act as the subcommittee. Both the concept and the request were considered; however, the Committee felt that it was premature at this time to establish such a subcommittee.

Mary Anthony Weaver, Program Director for the Institute of Weights and Measures, presented an informative talk on the Institute's past and future activities. In her presentation, Ms. Weaver detailed to the Conference the format and various types of training made available by the Institute.

(Item 403 was adopted)

404

WEIGHTS AND MEASURES PROGRAM EVALUATION

The Committee completed the pilot evaluation program during 1980. The Committee judged the criteria used in the field evaluations to be valid and developed a format through which they could utilize the criteria to effectively conduct an on-site evaluation and report those findings and recommendations back to the jurisdiction.

During the interim meeting, the Committee met and evaluated the material presented to them by the three field evaluation teams. By utilizing a standard format and the full consensus of the Committee an evaluation report was written, containing item by item comments and general category recommendations. These reports were sent to the four jurisdictions (Louisiana, Idaho, Philadelphia, PA, and Seattle, WA) evaluated with a request that the jurisdictions convey to the Committee prior to the annual meeting their opinion of the report, whether or not it was a useable document and if so in what way.

The Conference had appropriated \$2500.00 for the four field evaluations. Actual cost was \$2460.29. The teams were able to stay within this budget by utilizing super saver airline rates, minimum per diem rates, and ground transportation provided by local jurisdictions.

The committee heard from Mr. Lyman Holloway of Idaho, Mr. William Sullivan of Seattle, Washington, Mr. Phil Stagg of Louisiana, and Mr. Sam Valtri of Philadelphia, Pennsylvania, whose programs were evaluated this past year. They all spoke favorably of the committee's evaluation of their programs and were able to use the report to aid them in securing additional budgets.

The committee will annually conduct program evaluations of State and local jurisdictions. The committee will establish four two-man regional evaluation teams, consisting of one committee member and an individual selected by the committee who has a weights and measures background.

During this year the committee requests a budget of \$6,000.00 to conduct a minimum of four evaluations. Budget breakdown is as follows:

Committee Member

3 1/2 days per diem @ \$65.00	\$228.00
Air travel	400.00
	628.00

Private Sector Committee Member (retired weights & measures official)

3 days salary @ \$50.00	\$150.00	
3 1/2 days per diem @ \$65.00	228.00	
Air travel	<u>400.00</u>	
	778.00	\$1406.00
Four teams @ 1500.00 each		\$6000.00

Interested private sector individuals may send resumes to Committee Technical Advisor, R. N. Smith at OWM.

(Item 404 was adopted)

405

ADVERTISING COUNCIL, INC.

A proposal for Conference action has been presented as a major means to assist all weights and measures officials to be continually recognized by U.S. consumers in all geographical areas as the key factor in protecting the interests of buyers and sellers of commodities at all distribution levels.

The proposal introduced by Dick Hurley, of Fairbanks Weighing Division, provides the NCWM an unusual opportunity to promote the daily activities of each of our members through applying for support by the Advertising Council. The results can be strong public service media support for each Conference member in his local jurisdiction. The proposal must be offered for acceptance by the Advertising Council, and, if accepted, can result in the same long-term impact as other Council campaigns across the country (examples: Smokey The Bear-- Forest Fire Prevention, Red Cross, and others).

The initial preparation of publicity material will require substantial financial support by the Conference.

The Committee expresses its whole-hearted enthusiastic support of the concept with the belief that it could be within the resource capabilities of the Conference.

During our open committee hearings held on July 14, 1981 in St. Louis, Missouri, Richard Hurley had a detailed explanation of the concept of utilizing the Advertising Council as a vehicle to educate all of the people of the United States in the value of weights and measures programs.

In conjunction with this committee and OWM, Mr. Hurley has prepared the initial application to be submitted to the Advertising Council for consideration as a client. This application will be submitted immediately following acceptance of this item by the Conference. If the NCWM is accepted as a client by the Ad Council the initial funding production costs will be absorbed by the OWM under the direction of Mr. Al Tholen.

The committee is very excited about the possibility of this proposal and urges all NCWM members to support this item.

(Item 405 was adopted)

406

NATIONAL CERTIFICATION PROGRAM

The Committee received a proposal from the Western Weights and Measures Association to pursue the concept of a national certification program for weights and measures officials. The Committee views this proposal favorably and plans to develop a concrete proposal to submit to the Conference for approval in the future. The Committee would appreciate and solicits input from the membership on this important item.

(Item 406 was adopted)

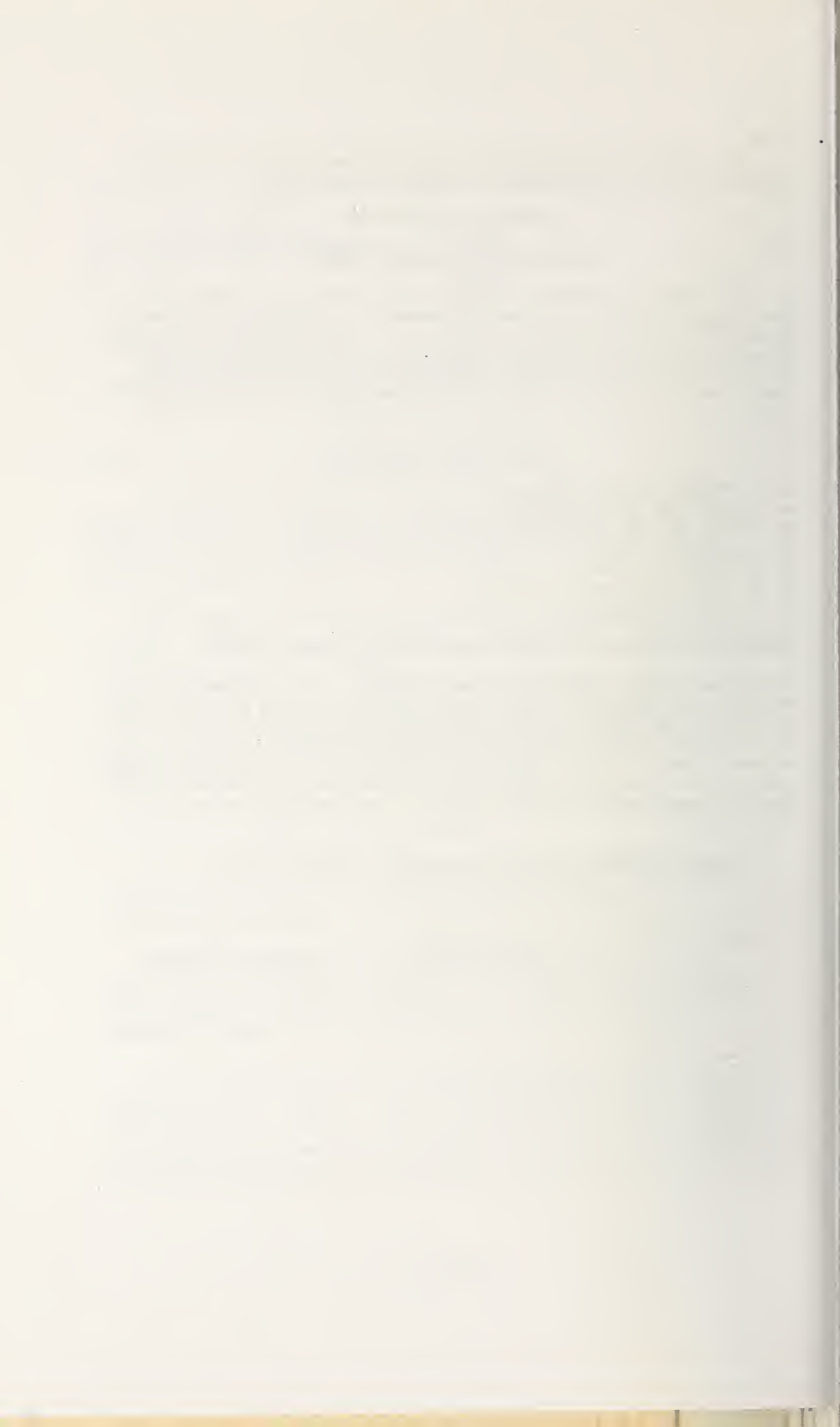
S. J. DARSEY, Florida, Chairman
 A. L. CHRISTIE, South Dakota
 T. GEILER, Hyannis, Massachusetts
 J. L. SWANSON, Alaska
 R. W. WALKER, Indiana
 R. N. SMITH, NBS Technical Advisor
 H. F. WOLLIN, Executive Secretary

Committee on Education, Administration, and Consumer Affairs

(On motion of the committee chairman, the report of the Committee on Education, Administration, and Consumer Affairs, voting key items 400 through 406 was adopted in its entirety by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference.)

VOTING RESULTS--Committee on Education, Administration,
 and Consumer Affairs

Voting Key	House of State Representatives		House of Delegates	
	Yes	No	Yes	No
401				
402				
403	40	0	45	0
404				
405				
406				



REPORT OF THE COMMITTEE
ON LIAISON

Presented by DR. EDWARD HEFFRON, Chief,
Food Inspection Division, Department of Agriculture,
Lansing Michigan

(Thursday, July 16, 1981)

VOTING KEY

500

INTRODUCTION

The Committee on Liaison submits its report to the 66th National Conference on Weights and Measures (NCWM). The report consists of the tentative report as offered in the Conference Announcement and as amended by this final report. The report represents recommendations of the committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the Committee.

501

STATE MEASUREMENT NEEDS STUDY

The Liaison Committee received an oral report from Dr. Carroll Brickenkamp of OWM on the status of the State Measurement Needs Study begun in the fall of 1980. The report follows.

(Item 501 was adopted)

Study of State Measurement Needs:
A Progress Report

by

Carroll S. Brickenkamp

The National Bureau of Standards (NBS) has been asked by the outside review panel for the Directorate for Measurement Services, under which the Office of Weights and Measures (OWM) operates, to assess the weights and measures system and its needs today. (This panel has been chaired for several years by Syd Andrews from Florida). The panel expressed concern that State and local weights and measures regulatory agencies were not thoroughly prepared to meet the challenges of the increasing use of new technologies and practices in the marketplace of today. Thorough preparation requires thorough technical support, such as the publication of handbooks, provision of training, development of technical criteria, and other kinds of technical assistance which, the Panel said, the OWM should be providing at a steadily increasing rate.

The OWM obtained funding from the NBS Planning Office last year in order to oversee a study that would assess the needs of State and local weights and measures agencies and industry in the broad area of weights and measures. Originally conceived as a joint effort between the NBS and an outside contractor, it is now solely an NBS project.

No small sample of States can adequately represent the characteristics and needs of the entire weights and measures community; however, due to constraints of time and resources, we selected seven States to visit and determine their needs and expectations. The seven States were selected because of their geographical distribution across the United States, their industrial/agricultural mix, population density and size, and the type of weights and measures organization (whether State only, State/county combination, and so on). Dr. Sanford Newman from the NBS Planning Office, Mr. H. F. Wollin, Mr. Otto Warnlof, and I, separately and in pairs, visited California, Idaho, Kansas, Minnesota, New Jersey, North Carolina, and Texas this past spring. Additionally, Maryland State Weights and Measures and Maryland Department of Agriculture personnel were consulted in order to help insure the adequacy of the interview methods.

We visited not only the State weights and measures offices, but also selected county and city weights and measures agencies in these States. We have also visited local businesses, industries, trade organizations, other State and Federal agencies with responsibilities that overlap or interact with weights and measures agencies, and national trade and professional organizations. We wish to thank everyone who devoted so much time to us, which in some cases amounted to several days.

We have recorded both the spoken concerns that the weights and measures officials and others in the community voiced, as well as the needs that were not voiced but that we observed through these indepth interviews, during earlier visits, and through written communications.

First of all, I should report that we have uncovered no surprises in this study. Priority needs expressed by those we visited can be grouped under the broad headings of:

- ° Leadership for the weights and measures system and of the National Conference on Weights and Measures
- ° Support of State field activities, including training
- ° Development of a National Type Approval Program

About the National Conference on Weights and Measures (NCWM), for example, we were frequently asked whether NBS intends to support the NCWM or intends to drop its support.

I should note that the most important need, as perceived by the State and local weights and measures jurisdictions, was the need for more manpower and other resources. "Proposition 13 Fever" has spread across the entire United States; all but two local jurisdictions we spoke with saw this as a tremendous problem for continued weights and measures surveillance. We think this cry for more manpower and resources demands that our attention be directed to increasing the efficiency and effectiveness of the existing weights and measures regulatory system.

I should also note that a need, not mentioned but observed by the study group, was for technical assistance in data management. There is an enormous amount of data being collected by weights and measures officials; but there are data available and useful to weights and measures officials that are not being collected, and the data that are being collected are not easily retrievable for subsequent analyses. These data should be the bases for effective management and program justification.

Another need repeatedly mentioned was training. A prerequisite for any training, of course, is documentation such as handbooks and manuals. Thus, although the need for handbooks was not always specifically voiced, handbooks have to be given a high priority if training has a high priority. I should mention that we noticed widely varying abilities on the States' parts to give training themselves. Certain organizations besides the traditional State government offices were investigated as resources for weights and measures.

Finally, type approval was mentioned both by State and local jurisdictions and by industry as being essential. Everyone we spoke with wanted a central national program. The device industry is concerned about the costs to them for type approval. Although there is no clear perception about the kind of organization in which this approval system should be imbedded, a significant number of people said that it should not be a Federal government regulatory program.

The final report of this study must consider the deliberations of the NCWM and its task forces and study groups on enforcement uniformity, prototype, package control, national weights and measures system, and grain moisture. It is my hope that the report will reflect the inter-related goals and objectives of these task forces and study groups.

The final report will also cover the changing responsibilities of State and Federal Government in carrying out weights and measures related programs, and the changing perceptions of the public and industry with respect to weights and measures.

We wish to produce recommendations that will work. In order to work, these recommendations must encompass not only the needs and perceptions of the NCWM and individual States and industries, but also the perceptions of NBS and the Department of Commerce management. Therefore, it is extremely pertinent that the House Subcommittee on Science and Technology held hearings on the Organic Act of the NBS, and that three members from the weights and measures constituency testified at those hearings. The Bureau management is concerned; and it will consider recommendations that this study, with the input of the weights and measures officials, would propose.

502-1 NET WEIGHT

The Committee participated in the drafting of a letter of comment to the USDA and the FDA on December 10, 1980 stating the Conference position on the proposed net weight labeling regulations published in the Federal Register on August 8, 1980; see Section 205-2 of the Laws and Regulations Committee report.

At the interim committee meetings the Liaison Committee met in joint session with the Laws and Regulations Committee. There were no USDA or FDA representatives present. However, recent information received from USDA and FDA indicate they do not expect to publish a final regulation on their net weight labeling proposals in the near future.

The committee intends to reiterate to the USDA and FDA the Conference's position on net weight labeling and expresses disappointment with their delay of action.

(Item 502-1 was adopted)

502-2 AEROSOL PACKAGED PRODUCTS

On May 4, 1979, the NCWM petitioned the FDA to amend its regulations to require that food and cosmetic aerosol products bear declarations of quantity in terms of net weight only. William Randolph, Deputy Associate Commissioner for Regulatory Affairs, Food and Drug Administration, in a July 10, 1981 letter notified the committee that a proposal concerning aerosol package labeling will be published in the Federal Register by the middle of August, 1981.

(Item 502-2 was adopted)

502-3 FEDERAL GRAIN INSPECTION SERVICE

The Committee met with Mr. Dick Pforr, Chief, Scale Testing and Weighing Branch, and Mr. Ben Banks, Program Manager, Railroad Track Scale Program, as representatives of the USDA's Federal Grain Inspection Service (FGIS). The purpose of the meeting was twofold, (1) to discuss developments during the past twelve months in relation to the calibration and certification of master track scales and the testing of FGIS and other railroad track scales, and (2) to monitor any problems generated by the overall FGIS program.

There are approximately 5500 railroad track scales which are tested and approved through the use of test cars operated by the railroads and State agencies. Those test cars are calibrated by reference to a system of 16 master track scales throughout the United States. The calibration of the 16 master scales and the testing of 48 track scales for which FGIS is directly responsible are being done with a single test car operated by FGIS. A new second test car was scheduled for

delivery early this year. As of July 1 the second test car is in service on a West coast itinerary.

The two test cars operated by FGIS are to be calibrated once each year by use of the NBS master standard at the Clearing, Illinois, master scale facility. The NBS standard is to be recalibrated at least every five years by the National Bureau of Standards at Gaithersburg, Maryland. In this way traceability is to be maintained.

In 1980, with the single test car in operation, FGIS completed an Eastern itinerary with the following results. Master track scales in Minnesota, Illinois, Florida, West Virginia, Virginia, and North Carolina were calibrated by FGIS and concurrently certified by cooperating State officials. Two master scales in Pennsylvania and one in Tennessee were calibrated by FGIS but State officials were not present to certify them. In addition more than 20 FGIS track scales were tested and approved and six railroad test cars were calibrated.

With two cars in operation, FGIS plans to calibrate all master scales once a year, test all FGIS track scales twice each year, and calibrate as many railroad test cars as can be conveniently worked into the schedule.

FGIS cannot certify scales. It was emphasized that they would like to have the cooperation of every State so that all FGIS calibrated scales and test cars are simultaneously certified by the appropriate State officials.

It is the stated intent and purpose of FGIS to carefully continue the calibration and certification of the master track scales and the testing of FGIS scales, and to maintain traceability of standards to NBS. It was impressed upon the FGIS representatives that such traceability was an extremely important facet of the responsibility they assumed when they took over from NBS the operation of the two test cars and the Clearing facility.

With respect to the Clearing facility it was reported that NBS had moved out, physical plant improvements are being made, and FGIS has a full time employee operating out of the location (serving the Western itinerary). The legal transfer of the facility from the NBS to the USDA has been completed.

In response to the Committee inquiry concerning the security of the master standard and master scale at Clearing, Mr. Banks informed the Committee that the security of the NBS master standard and all master scales is left to the railroad security forces.

Mr. Pforr advised the Committee that the applicable law had been changed during the past year so that inbound FGIS weighing to export elevators had become permissive instead of mandatory, but he noted that there had been no resulting decline in weighing practices.

The Committee believes that the integrity of the railroad track scale system is enormously important to commerce and recommends continued close liaison with FGIS by NBS and the National Conference in relation to the performance of FGIS during the years ahead. (It should be noted that, on June 18, 1981, testimony by James R. Bird, Deputy State Superintendent, New Jersey Office of Weights and Measures, on behalf of the NCWM, before the United States House of Representatives Subcommittee on Science, Technology, and Research recommended the return (with adequate funding) of the Railroad Track Scale Certification Program to OWM.) The Committee also recommends that State and local weights and measures officials strive for full cooperation with FGIS, search for ways to minimize duplicative effort, and report to the National Conference any instances of friction between FGIS and the railroads or themselves.

(Item 502-3 was adopted)

502-4 MALT BEVERAGE LABELING

Immediately prior to the 1980 National Conference on Weights and Measures (NCWM), Mr. George W. Ososke, Executive Vice President of the California Brewers Association, by letter petitioned the Conference to reconsider what were described as "defects in the measurement of malt beverages." This petition was assigned to the Laws and Regulations Committee and considered by the Liaison Committee because of interagency interfacing.

Representatives of the California Brewers Association and other brewery officials met with the Committee on Laws and Regulations and the Liaison Committee in joint session and separately with the Liaison Committee during the NCWM interim meeting. The Liaison Committee noted that part of the brewers' petition included the condition of "unfavorable measurement experiences in the State of California which place brewing companies in the position of being caught between assessments by the Bureau of Alcohol, Tobacco, and Firearms (BATF) for over filling, and seizures and citations by the County of Los Angeles in the State of California for allegedly underfilling."

Testimony indicated that BATF permits brewers 0.5 percent (tolerance) overfill while being taxed on the labeled quantity. However, the BATF (at their discretion) can assess the brewer for any fill beyond the 0.5 percent tolerance. The possibility exists that when targeting above the labeled weight in a high-speed filling operation, some overfill beyond the 0.5 percent tolerance may occasionally occur and thus tax may have to be paid on the overfill in excess of 0.5 percent. The Liaison Committee considered meeting with officials of BATF to further explore the problem and seek a solution. However, the brewers' representatives were not interested in considering this as a possible resolution, and consequently the Liaison Committee does not feel its involvement is warranted.

(Item 502-4 was adopted)

502-5 SPHYGMOMANOMETERS

The Association for the Advancement of Medical Instrumentation (AAMI) has been fostering the development of standards for non-automatic and electronic or automated sphygmomanometers. The AAMI Draft Standard for Non-automated Sphygmomanometers (February 1980) and the AAMI Draft Standard for Electronic or Automated Sphygmomanometers (February 1980) have progressed with some revisions to become Proposed AAMI Standards (August 1980 Revisions). The proposed standards as modified prior to and at the AAMI Sphygmomanometer Committee Meeting of May 12, 1981 will be submitted to the AAMI Standards Board for approval. After approval they will be submitted to the American National Standards Institute. Copies of the proposed Standards for electronic and automated sphygmomanometers may be obtained from:

Ms. Judith Veale
Manager
Technical Development
AAMI
1901 North Fort Myer Drive
Suite 602
Arlington, Virginia 22209

Comments concerning the proposed standard should be directed to Ms. Judith Veale.

(Item 502-5 was adopted)

502-6 GRAIN WITH MOISTURE ADDED

Recently the National Bureau of Standards referred to the Laws and Regulations Committee a petition from the Oklahoma Grain and Feed Association. This Association has inquired as to the legality of selling dry grain that has had water added after harvest.

Apparently when grain is harvested in a drought season the grain is much drier than necessary to meet maximum moisture standards and weighs much less because of the lack of moisture. In an effort to make up for this deficiency in moisture (with the consequent deficiency in weight) an agriculturist has been advocating the addition of water to very dry grain under prescribed conditions to restore moisture.

The Committee on Laws and Regulations, prior to developing a method of sale for the commodity, requested the Liaison Committee to ascertain from FDA as to whether dry grain with water added is permissible. Taylor M. Quinn, Associate Director for Compliance, Bureau of Foods, FDA, stated in a February 3, 1981 letter: "The intentional addition of water to wheat would appear to violate the Federal Food, Drug, and Cosmetic Act, which prohibits the unnecessary addition of water to a food."

(Item 502-6 was adopted)

THE ROLE AND FUNCTION OF THE LIAISON COMMITTEE

The Liaison Committee believes it has not been utilized as fully as it could be or should be in either its traditional functional area, or in its extended role. Moreover, there are additional or new assignments within the Conference in which the Committee logically can and should be involved. These three categories of activity are as follows.

I. Traditional Role:

Intergovernmental (NCWM with NBS/USDA/FDA/FTC/DOD/Postal Service/etc.) contacts and relations on behalf of the Conference. This role involves explaining, advocating, and coordinating Conference positions, recommendations, and needs before Federal government agencies and promoting uniformity among those agencies and with NCWM.

II. Extended Liaison Role:

Performing, in addition to the above functions,

- 1) interjurisdictional (between weights and measures jurisdictions) liaison;
- 2) liaison with regional weights and measures associations;
- 3) drafting, developing, and formulating NCWM positions (in multi-disciplinary standards areas) for use in the NCWM's participation in international standards development (OIML, etc.).

III. Additional or New Liaison Assignments

- 1) Ex officio participation of Liaison Committee members with other NCWM Standing Committees (by assignment) to facilitate liaison needs of those groups.
- 2) Coordinating the activity of and the reporting to the Conference by the burgeoning number of independent NCWM task forces and special study groups loosely functioning under the Policy and Coordination Committee.

Thorough, broadly based discussion should precede any decision to dismantle the Liaison Committee or de-emphasize the importance of the liaison function to the work of the Conference.

(Item 503 was adopted)

REGIONAL CONFERENCE LIAISON COMMITTEES

The Liaison Committee has often been aware, in an unofficial manner, of ongoing and occasional liaison problems being faced by individual State Weights and Measures officials and their counterparts in Federal agencies as well as difficulties experienced with associations and other organizations. Too frequently, these problems and difficulties are not adequately addressed and the issues not resolved to their satisfaction.

The NCWM Liaison Committee urges the Regional Associations to consider the establishment of a formal working entity to assist individuals and groups in the functions of liaison within their geographic areas of representation. Identified needs, problems, or difficulties between agencies, organizations, or associations which are beyond jurisdiction of the Regional Associations may be referred to the NCWM Liaison Committee for assistance.

(Item 504 was adopted)

TASK FORCE ON GRAIN MOISTURE MEASUREMENT ASSURANCE

Report of the Task Force on Grain Moisture Measurement

The national & regional coordinators of the task force met with all interested participants, July 15, 1981, as part of the NCWM annual meeting. The coordinators are:

Leo Letey, Colorado, representing the Western W & M Assn.
 Sid Colbrook, Illinois, representing the Northeastern W & M Assn.
 James O'Connor, Iowa, representing the Northwestern W & M Assn.
 Richard Thompson, Maryland, representing the Southern W & M Assn.
 James Driscoll, Federal Grain Inspection Service,
 San Hindsman, Arkansas, National Coordinator

Floyd Nierenberger represented James Driscoll from FGIS at this meeting. Carroll Brickenkamp is the task force's technical advisor.

Forty-five representatives of States, industry, and Federal Government participated in an open forum at this meeting.

Summary Status of Task Force

The task force was established in 1977 for the purposes of establishing uniformity in field testing procedures and lab reference procedures.* In 1979, a three-day seminar was held in Atlanta, Georgia to develop uniformity in lab and field test and reporting methods. Approximately 20 States agreed to participate in data collection using these procedures.

*From 1974 to 1977, Carroll Brickenkamp and Frank Jones of NBS provided consultative services to States desiring to set up grain moisture meter testing programs. They provided economic data to justify a program, equipment lists, and training in laboratory & field techniques. They began collecting data in order to recommend tolerances for grain moisture meters based on tests using grain samples which had been originally suggested by Steve Hasco from NBS.

The task force attempted to hold another seminar at the FGIS labs that year, but because the labs were not yet set up completely, this was delayed. FGIS hopes to be able to hold a joint seminar with the National Task Force in February, 1982.

In 1980, Illinois & Iowa formed their own two-State task force in order to move ahead specifically in the area of corn moisture testing. They have collected data resulting in new corn calibrations for meters. Reports from each State as to the status of its program are now presented:

ALABAMA

(John Rabb reporting)

We are still in the developmental stage of our program. We do have a few pieces of equipment that we have acquired through surplus sales and also requisitions. We had money appropriated this year for the entire program but someone else in the government got the money. We have been asked to resubmit to a special session of the legislature this year and we have done so; they hope to get us the money this year. I talked to Tom Kirby (Georgia) not too long ago and he said they may be able to help us and we may be able to get started this year.

ARKANSAS

(Sam Hindsman reporting)

We believe that the State's role in testing moisture meters is to assure the farmer and the grain elevator operator that there can be greater accuracy in the determination of moisture content in grain. It is important to develop sound laboratory procedures, field testing procedures, and statistical information to justify our program and to evaluate results.

The Grain Moisture Meter Section of the Arkansas Division of Weights and Measures has been developing its program since July 1, 1973. In the early stages of development, with the assistance of Dr. Carroll Brickenkamp and Mr. Frank Jones of NBS, we made the decision to use oven-tested grain at high, medium, and low moisture content as our State standard. In addition, we prepare on a weekly basis four high moisture samples identified as A, B, C, and D; four medium moisture samples identified as A, B, C, and D; and four low moisture samples identified as A, B, C, and D. If the investigator is using the "A" set of samples for tests, he may have B, C, and D as back-up sets of samples if needed during the week. If two investigators are testing during the week, one will have a set of "A" standards with "B" standards for back-up and the other investigator will have a set of "C" standards with "D" standards for back-up.

We believe that it is best to get grain with the highest possible moisture content for the laboratory. We never attempt to artificially increase moisture content of grain samples. We prefer to dry high

moisture grain to the medium and low moisture content ranges desired. Therefore our investigator will collect grain samples from the combine in one gallon glass containers. The collected grain is transported from the field in a portable refrigeration unit located in the trunk of the investigator's car. This unit holds a constant 40 °F temperature for grain protection. Upon arrival at the laboratory the grain is transferred from the automobile to a laboratory refrigerator which also is adjusted to hold a constant 40 °F temperature for safe storage.

Using official U.S.D.A. oven test methods, the Laboratory Technicians determine the moisture content of the various grain samples and prepare grain transfer standards to be taken to the elevators for testing purposes. In order to maintain sample integrity, the grain standards are transported under refrigeration.

At the testing site, the inspector checks the grain moisture scale and thermometer for accuracy and also determines if the proper charts are being used. The moisture meters are tested with the prepared grain standards (allowing the samples to come to room temperature in closed jars before use). The manufacturers' recommended test procedures are followed and the test results and information are recorded on an official inspection report. All moisture meters must meet a ± 0.5 tolerance for approval.

After each season, results of all field tests are tabulated and the statistical data are plotted on graphs and charts and sent to the respective meter manufacturer, National Bureau of Standards, and U.S. Department of Agriculture (USDA).

- NOTES:
1. All meters are tested prior to the harvest season.
 2. Sample exchange with various States and USDA is maintained on an annual basis.
 3. All field grain standards are re-tested in the laboratory at the end of each week.

Considerable effort was expended on inspecting and testing all grain moisture meters and grain elevators prior to the harvest season this year. We started the program the first of March and completed our testing program the last of May. We completed all meter testing prior to the beginning of the wheat season. Our objective was to assure both farmers and grain operators of meters accurate at the start of the season. A total of 361 meters were tested. A minimum of five samples of soft red winter wheat and soybeans with moisture contents ranging from 17 to 12 percent were used in the testing process. Sixty-six moisture meters were rejected for non-compliance with State laws, which is 18% of the total. Of the 66 meters rejected 11 were found to be defective in the pretest determination and were rejected for mechanical reasons, not tolerance conditions. To date, all of the rejected meters that were sent to the factory and returned after calibration and repair have been retested and approved for commercial use. During the harvesting, grain elevators will be spot checked and it will be verified that the

meters are maintaining their accuracy. In addition, inspection will be concentrated in problem areas where complaints are received. A problem that continues to cause confusion and complaints is related to the FGIS soft red winter wheat chart for the Motomco moisture meter. Port elevators and USDA grading stations are continuing to use the 1963 soft red winter wheat chart. All other facilities and public grain elevators are using the 1979 chart developed for the State of Arkansas by Motomco. The two charts vary in meter reading values from 0.43% to 0.66% in moisture content. This difference has caused heated disputes between farmers and grain elevators due to the fact that many farmers take their grain samples to USDA grading offices to verify the moisture content given by the grain elevators. In addition, the grain elevators are upset because of the discrepancy of their meters with those at USDA port elevators. We are desperate for national charts for all grain that are updated in a regular and timely manner, and we are desperate for someone to provide this service.

We have always thought that USDA should provide that service. They have done it in the past and we have been very hopeful that it would be done in the future. It is a draw back to our program. It is going to be very difficult for us to enforce one chart in the State when the surrounding States are using a different chart or if FGIS grading stations are using a different chart.

CALIFORNIA

(Ezio Delfino reporting)

1. Program Size:
 - a. 272 moisture meters were tested in 24 counties with certified grain samples prepared according to the USDA oven method.
 - b. This work was accomplished through the use of two seasonal employees to test the meters and accessories, and one Weights and Measures Tech II to develop the test standards and supervise the total operation. A combination of 22 person-months were expended in the overall effort.
2. Comparison Chart 1979-1980 (See tables at end of California report).
3. Primary Problem Areas:
 - a. The Motomco moisture meter, used almost exclusively by the California rice industry, employs calibration charts that were formulated for older rice varieties. New strains have been developed. New charts have not been developed to correspond with these varieties. USDA-FGIS prepares most of the charts for the Motomco meter. We are evaluating the existing rice charts to determine whether new ones are necessary, and if so, for which moisture ranges and varieties. More accurate charts would mean more precise moisture measurements.

- b. Our first attempt this year to revise the charts was not successful because we do not yet have sufficient data to compensate for the new varieties and also for the additional problem with transistorized Motomco meters, mentioned below.
- c. The Rice Growers Association (RGA) had many of their Motomco moisture meters converted from using tubes to transistors. It now appears that some of the transistorized meters give low readings at higher moisture levels (19-27%). Many of these meters are being changed back to the use of tubes.

In the meantime, the question of exactly what the problem is with these meters has not yet been resolved.

4. Summary and 1981 Goals:

A steady and significant improvement in average meter accuracy has been achieved for all grains except rice. Program focus in 1981 will be on identifying the nature of the problem for rice and separating those aspects attributable to the transistorized meter, those attributable to new (uncharted) varieties, and those arising from an overall chart inaccuracy for our growing conditions.

We hope to make significant progress toward establishing the data base for partial calibration chart revisions during this growing season.

For the 1981 growing season, we also plan to continue with the existing enforcement tolerance structure and policy.

The 1981 data will be available approximately January 1, 1982.

COMPARISON OF MOISTURE METER ACCURACY IN CALIFORNIA

1979

<u>Grain</u>	<u>Average Error (% moisture) Per Test</u>	<u>Number of* Meters Tested</u>	<u>Meters In** Tolerance</u>
Corn	+0.13	82	74%
Barley	-0.10	65	89%
Wheat	-0.04	57	91%
Milo	-0.21	58	83%
Rice	+0.06	86	52%

1980

<u>Grain</u>	<u>Average Error (% moisture) Per Test</u>	<u>Number of Meters Tested</u>	<u>Meters In** Tolerance</u>	<u>In Tolerance** Meter Improvement</u>	<u>Accuracy Change 1979-80</u>
Corn	-0.0013	64	94%	+20%	Error decrease by a factor at 100
Barley	-0.12	38	92%	+3%	Unchanged
Wheat	-0.04	44	93%	+2%	Unchanged
Milo	-0.03	44	89%	+6%	Error decreased by a factor of 7
Rice	-0.14	82	65%	+13%	Error Doubled***

* Each meter received a minimum of three tests at several moisture content levels for each grain normally processed by the meter. The test range for moisture level duplicated that actually measured by the meter in the field.

** Enforcement level tolerances summarized on next page.

*** Although more meters met tolerances, some of those that failed were worse than prior year results. This is probably due to a combination of the following circumstances:

1. Introduction of transistorized model of Motomco moisture meter;
2. New varieties of rice being used;
3. Basic problem with certain moisture ranges in charts is still unsolved.

Enforcement Field Test Tolerances for 1979-1980 in California.

The tolerance structure for taking enforcement action is expressed in terms of a fraction of the percent moisture content (M.C.) of the standard, together with a minimum tolerance.

Tolerance application is relative to the average of at least three (more if significant spread for observed values) measurements for the sample.

	TOLERANCE	MIN. TOLERANCE
Cereal Grains (except Corn, Rice)	0.05 times %M.C.	± 0.7 %M.C.
Corn, Rice	0.06 times %M.C.	± 0.8 %M.C.
Oil Seeds (Safflower, Soybeans)	0.1 times %M.C.	± 0.7 %M.C.

Example: Wheat. Standard sample moisture content 15.2%; Tolerance:
 $0.05 \times 15.2 = 0.76$; round to 0.8 and since this exceeds the
minimum tolerance, use ± 0.8 %M.C. as enforcement tolerance.

COLORADO

(Leo Letey reporting)

To date, a sweep through Southeastern Colorado counties (Baca, Bent, Crowley, Kiowa, Otero, Pueblo, and Prowers) has been accomplished. The meters in Adams and Denver countries have also been tested.

We have compiled data on rejection rates and the percent of moisture content change in the official field samples, after a day's use. The change in moisture is from a small sample and should not be considered to be representative of what we can expect in the field.

Wheat	@ 10.25%	Avg. Change	+ 0.04%
Milo	@ 12.45%	Avg. Change	- 0.12%

The above figures include samples used during high temperatures and humidity (100 °F and 60%).

Compared to 1979, our first sweep through the same area, the rejection rate has declined by 5%, 34% to 29%. Observations are: test cells are often dirty and the grain charts on milo are generally outdated.

While explaining the information on the test certificate, we explain to the owners the importance of keeping the cell clean and of keeping up-to-date charts.

DELAWARE

(Eugene Keeley reporting)

The Weights and Measures Section of the State Department of Agriculture in the State of Delaware assumed the responsibility of testing grain moisture meters in 1980. Before this time, it was done by the Seed Section which used a master meter for comparison.

In our first year of testing, we used official grain samples where the moisture content had been determined by the oven method. Using existing tolerances that had been adopted in our State several years ago, approximately 50% of the meters that were tested with barley, corn, soft red winter wheat, and soybeans did not meet the tolerances of 0.5% for grains up to 22% in moisture and 0.75% for grains over 22% in moisture.

In 1981 we changed our tolerances to be compatible with the tentative code for Grain Moisture Meters as recommended by the Task Force on Grain Moisture meters. Using the same testing procedures as the year before we obtained much better results.

Each meter was tested with low, medium, and high moisture content barley, soybeans, corn, and soft red winter wheat taking the average of five drops.

Measuring barley, all meters passed. With soybeans, all meters passed measuring low and medium moisture grain and 99% passed measuring high moisture grain.

Measuring corn, all meters passed on low moisture, 99% on medium moisture and 86% passed on high moisture.

Testing with soft red winter wheat, 91% passed on low moisture, 97% on medium moisture, and only 46% passed with high moisture grain.

By adopting the recommended tolerances set forth by the Task Force, we reduced our rejections considerably; however, we are still very much concerned about the rejections we are experiencing in high moisture corn and wheat.

Even though our State is small in comparison with the others represented here, our concerns are the same and Delaware remains available to assist the Task Force in any way we can to help achieve an equitable and workable code.

FLORIDA

(William A. Cogburn, Jr., reporting)

The end of the 1980 grain season in Florida was the end of the fourth year of involvement in moisture testing by the State. The period of testing meters is relatively short in Florida due to the limited volume of crops produced, mainly corn, soybean, and wheat. In the past, meters were checked during the season. Our projection for 1981 is to test them before and during the periods of use. In all probability, some of the meters should be tested at intervals during the year; since transactions are made on a limited basis throughout the year. In the past, Florida has used 5% of the moisture content of the test sample as the tolerance value applied, plus or minus, to the meter reading to determine acceptability. The rejection rate was approximately 30% in 1980; this may seem dismal. Two or three factors can account for this high rate.

To begin, several loaner meters which did not pass were included in these figures. Meters that had correction notices from the year before but which had not been repaired were also included. But the main factor was that a couple of makes of meters that comprise a large portion of the population had a poor performance record. One of these which is second to the leader in population had a 60% rejection rate. I feel the cause of this high rejection rate, or larger portion of the cause, is that the units are accessible to the operator by key. Personally, I feel this is regulatory problem that should be overcome.

A lot has been gained from our experience but we must now get the whole ballgame together. We have found that sample handling during preparation before field use and during field use is most critical, especially with corn. For example, it is my belief and experience that upon preparation of high moisture corn the sample material has to stay in bulk storage several days in order for moisture to equilibrate throughout the sample. Should a sample be prepared without this step--by chance, one or two extremely high moisture kernels could enter into the small sample upon analysis causing a high or non-representative reading.

We have also found that the manner of handling the sample in the field to be very important. For example, care has to be taken to guard against getting water into the sample upon opening when having kept the sample on ice; that is, care must be taken when opening and attempting to use the sample when it has a temperature lower than the dew point of the ambient air. Exposing a sample to air when the sample temperature is lower than the dew point will cause condensation on the sample material and a high reading will result from subsequent test. Moisture gained in this manner will remain in the sample. This is critical for now the sample is not representative of its labeled moisture content.

In Florida, or any high humidity area, conditions do exist especially in the early mornings or on rainy days when precautions must be taken to avoid this problem. A call to a local weather bureau, a radio turned to an automatic weather broadcasting station, or a simple humidity determining device should suffice. I do feel these and some more unsuspected conditions in all probability can cause the most difficulty in achieving accurate results.

We, in Florida, are looking forward to the results of the Grain Moisture Measurement Task Force's efforts to establish common ground on a nation-wide basis.

GEORGIA

(Thomas Kirby reporting)

During the spring and summer of last year we sent data and various comparisons to Dickey-John, Stein Labs, and a few State labs involved in work on new charts and calibrations. This information covered January 1, 1979 to the present time. Dickey-John issued new calibrations for corn, oats, rye, soybeans, and soft red winter wheat. In October Stein Labs issued new charts for wheat on the D, S, RC, RCT, and G; new charts were also issued for corn on the G, RC, RCT, S, PT-2, SS250. These chart changes became effective March 1, 1981. The corn chart for D was added in December with the same effective data as the rest of the charts. In February work was begun on the calibrations for the Burrows 700 DMC on corn. March brought several policy changes for the State including a new report form to be filled out by the repair company when a machine is rejected; a "RED TAG" on anything over 3% out of tolerance; and a new wheat chart for the PT-2 machine. A new wheat chart for the Motomco 919 was issued in May for soft red winter wheat and work continued on the Burrows 700 DMC calibration for corn. Other areas looked at this past year were: a reworking of the field test report form into a legal sized sheet having seven columns for grain testing; a new decal to be put on a meter to show which grains and in what ranges the machine can operate within State tolerance; work on a new soybean calibration for Steinlite machines as well as wheat on the SS250; consideration of the effect of hybrids in corn on the calibrations and chart for the meters; work will be done with the Iowa-Illinois Task Force this fall. A break down on sample exchanges for this year is as follows: 23-USDA, 4-Stein Labs, 3-State of Colorado, 2-Dickey-John, and three are already set up for July with our new crop of corn.

Stock Samples	171
Tests Through Lab Meters	11,019
Oven Tests	1,336
Karl Fischer Titrations	156

We are considering the possibility of requiring meter manufacturers to send incoming devices, new or newly repaired, to the laboratory for initial inspection before delivery to buyer.

ILLINOIS

(Sidney Colbrook reporting)

The Illinois Department of Agriculture has currently been involved with the monitoring of the various commercially used grain moisture meters in Illinois for corn to determine if the calibrations supplied by the meter manufacturers are accurate.

Due to the complaints received from farmers and elevator operators as well as our grain moisture meter inspectors regarding the inaccuracies of the corn calibrations of the various meters, our Department gathered numerous grain samples in 1979 to determine in Illinois what problems existed. We exchanged grain samples with USDA and various other State laboratories to establish our air oven reference method. We implemented Dr. Brickenkamp's sample collection procedures to maintain the validity of the sample. Our laboratory then monitored the laboratory standard meters and concurrently our inspectors carried known moisture grain samples to unofficially monitor the elevator's meters. We found that significant errors did exist in various commercially used moisture meters. During this time we were working very closely with the State of Iowa. It appeared that corn grown in Iowa affected the meters in a similar manner as in Illinois.

A meeting was then held March 11, 1980 in Springfield to present to the meter manufacturers our results and establish prototype approval parameters and dates for new calibrations. The decision was made that even though limited samples were used in determining the errors in calibration, the magnitude of errors necessitated changes before the 1980 grain harvest. The objective was to require that all meters be comparable with USDA's oven reference method. Therefore, all meters would be comparable with each other. The recalibrations were required based upon our type approval program. The criteria for approving recalibrated meters establish by our Department for the laboratory type approval study were:

1. 80% of the average drops must fall with 1/2 of the Department's field tolerance (our lab performed between 100 and 110 average drops; each average drop consisting of three actual drops) as measured against the air oven standard.
2. 95% of the average drops must fall within the full field tolerance.
3. The plus or minus bias must not exceed +/- 0.25% in moisture content (bias is determined by computing the mean or average of the device readings and subtracting it from the accepted value; that is, the average of the results from the air oven).

The time frame established was that all recalibrated meters were to be submitted to us before June 1, 1980 and that all new approved calibrations must be completed and sent to the grain trade before September 1,

1980. Because of extenuating circumstances and the relatively small amount of data used, the validity of the results was questioned by the industry.

Therefore, a task force was established to advise the Illinois Department of Agriculture of new testing procedures and standardization of the grain moisture testing program. This task force decided that an expanded and more thorough study should be made with the 1980 corn crop to determine the changes, if any, that should be made at the higher moisture ranges. Our 1979 study was limited to 22% and lower moisture contents. A concerted effort was made with the Illinois and Iowa Departments of Agriculture, Iowa State University, and the University of Illinois to expand the testing of the 1980 crop throughout the entire range of moisture for corn.

We found that even with different types of growing seasons from the 1979 to the 1980 crop, no appreciable differences were found with the various hybrids to affect the accuracy of the recalibrations made in 1979.

At the present time in Illinois, we are using meter against meter testing to approve or reject an elevator's meter.

We are continually monitoring moisture meters with natural grain samples to find if such an official testing program would be feasible for Illinois. We do not inform our inspectors of what moisture the grain sample is; therefore, our results are completely unbiased. For a short period of time, we are approving one type of meter based upon the moisture content derived by the oven. I found our inspectors were using various samples until the elevator's meter would be approved. Our inspectors did not develop any confidence with that type of testing program. Also, we feel that a tighter tolerance may be used with a meter against meter program than a natural grain testing program. I do believe that a natural grain testing program would work if the inspection personnel has immediate access to the grain moisture meter laboratory.

I would like to personally thank all moisture meter manufacturers and all members of the Illinois/Iowa Grain Moisture Meter Task Force for their guidance and expertise which has greatly improved the Illinois Department of Agriculture's grain moisture meter program.

In closing, our Department has conducted over the past two years an extensive study of all the moisture meters marketed in Illinois specifically for corn. We intend to gather other grains during harvest to ensure their accuracy as well. We are going to continue an ongoing laboratory program to verify future crops and their response to those calibrations.

INDIANA

(Robert Walker reporting)

In 1969, the legislature passed an Act for Testing of Moisture Meters.

We have two full-time meter inspectors.

Annually we register approximately 1,150 meters; these are inspected once per year. There is a charge of \$10.00 per meter. If the meter is rejected, the retest is free, whether this rejected meter is retested or replaced by another meter. If an inspection is necessary on a complaint, there is no charge.

Indiana has not accepted Illinois-Iowa Task Force recommendations for the calibration adjustments of the meters and chart changes. We will observe the changes made to charts by the manufacturers.

Each inspector is equipped with the following equipment to test and inspect meters and other measuring devices.

1. Motomco meter, Model 919
2. Test Pads
3. Test Pellets
4. Capacitors
5. Test weights for gram scales and bushel weight devices
6. Over and under scale
7. Grain samples (for running comparison tests--this is limited because of no refrigeration for keeping samples while in the field)

Benefits from the program:

If nothing else, it is a fact that when this program was started in the first year there was a 30-40% rejection of meters. This past year our rejection was between 8-9%. It has brought about a good preventive program.

We feel there are merits to this program, but we also know it could and should be improved.

IOWA

(James O'Connor reporting)

In late 1978, complaints from concerned elevator operators and farmers led us to examine more closely the current methodology employed in grain moisture meters; i.e., the ability of grain moisture meters to accurately reflect moisture content in corn.

Corn, unlike soybeans, wheat, rice, or oats is not uniform in kernel size; at varying moisture levels, it will not pack uniformly in the moisture meter test cell, and will gain and lose moisture at much

faster rates than any of the previously mentioned grain types. In other words, its seemingly total unpredictability was not ready to be handled by any single State or Federal laboratory with a grain moisture program.

Aware of the success the State of Arkansas and Mr. Sam Hindsman had on wheat calibration, and confident that by assuring uniformity in methodology, success could be achieved on corn, we began our program of using grain samples as check standards in addition to testing meters on a meter-to-meter basis.

Since initial testing began, we have managed to accomplish the following:

1. Standardization of air-oven between nine (9) laboratories - four from industry, two State, one federal, and two universities.
2. Involvement of industry and Iowa's and Illinois' State and university laboratories in order to enhance the facilities currently available, thus broadening the scope of control and data available for evaluation by one group, known as the Iowa-Illinois Task Force on Grain Moisture.
3. The recalibration of meters in the 14 to 22% range before the 1980 corn harvest that significantly improved the accuracy and comparability of the major brands of meters.
4. The study of meter calibration from 22% to 35% in Iowa and Illinois and the subsequent recalibration of all major brands of meters across the entire range from 14 to 35% before the 1981 grain harvest.

The data showed no difference between the sample collected and tested over the 1979 and 1980 grain crops in Iowa and Illinois regardless of the different growing seasons in those years.

The actions of the Iowa and Illinois Task Force on Grain Moisture Measurement have provided the necessary foundation and supportive documentation for national adoption of the current corn calibrations successfully used in these two States over the previous two crop years. The initiative taken by the States of Iowa and Illinois have proven the serious lack of supportive data concerning corn, which the Federal Grain Inspection Service (FGIS) had, but on which the current national corn calibration is based. The current 1978 FGIS calibration for high moisture on the Motomco meters, according to data submitted to the Iowa-Illinois Task Force by FGIS, are supported by only 150 total samples, of which 75% came from the Iowa and Illinois area in 1976 and 1977. FGIS Statistician Woon Hyoun, using this data, submitted his report and recommendations to the chief, Standardization Division, of FGIS on June 7, 1978; and current Motomco FGIS calibrations were issued

effective August 15, 1978. Data (submitted by FGIS to the Iowa-Illinois Task Force), show that only nine high moisture corn samples (in the 20% to 29% range) were tested in 1978, 1979, and 1980 to verify the 1978 FGIS high moisture calibration. Before the 1979 and 1980 Iowa-Illinois recalibration of meters and charts, the spread of all grain moisture meters across the full operating range on corn was 1½ points up to 20% moisture and 2½ points above 20% moisture. Iowa and Illinois now have supportive data and new calibrations to eliminate this problem in moisture meters nationally, which is based on over 1500 different corn samples covering the 1979 and 1980 corn harvest, of which 560 samples range from 22% to 28%; 130 between 28% and 37%, and 14 above 37%. The Iowa-Illinois calibration data are based on a broader range and are more accurate. There are at times more samples in the Iowa and Illinois data, at any one point, than were used to calculate the complete current 1978 (19% to 29%) FGIS Motomco charts. I strongly urge all departments of weights and measures and FGIS to join with Iowa and Illinois, in the adoption of the Iowa and Illinois calibration, thereby resolving the problem of differing FGIS and other meter calibrations for corn and the adverse effects it will have on the national marketing of corn between farmers, processors, and shippers in the United States.

KANSAS

(John O'Neill reporting)

No Legislative action has been taken as yet in Kansas, because there is concern with the variables in this program; for example, that there are no definite standards to be traced to. They agree that the USDA Oven is the only standard, but the Legislature feels that definite improvement in this standard is needed.

They are also concerned with the quality of moisture tester offered for sale on today's market, since Kansas is moving away from being a service organization, just testing and approving or rejecting, towards a program which rides herd on commercial testing companies using variable frequency checking to see if they are doing their job. This program should also include an educational program for the users.

As zero based budgets are a part of living today it is highly unlikely that the Legislature will come forth with a program or testing equipment at this time. Of course, time will tell.

A private farm-oriented organization in Western Kansas teamed up with a private testing laboratory to do wet corn tests last year. Most of you have seen copies of their report. You will note a very serious mistake was made in their testing procedure with regard to the oven standard of USDA. The point is that an educational program is needed first, if resources are available.

KENTUCKY

(Ron Egnew unofficially reporting)

Kentucky's program began in 1971 and has used the USDA oven method as its reference from the beginning. We use samples of wheat, soybeans, and corn to test our field meters. Because no high moisture grain is being sold and because we do not believe we can carry high moisture samples into the field, we use only low moisture samples. We apply a tolerance of $\pm 0.5\%$ in moisture content and had a rejection rate last year of about 10-12%. We believe we can live with this program.

LOUISIANA

(Phillip Stagg reporting)

We are currently engaged in the initial check test for 1981. All the rice areas have been check tested with the following results: meters approved 176, meters rejected 27. We are operating our program on a fixed tolerance of plus or minus 0.5% in moisture content compared to the air oven standards. The program is being accepted much more favorably among commercial facilities than when we initially started the program. We feel the program is accomplishing the intended objectives which can be seen by the decrease in numbers of meters rejected. Also, the public is becoming more aware of the proper procedures to follow in determining moisture content with any brand of moisture meter. We feel that improper procedure is a major contributor to inaccurate moisture reading in Louisiana. The operators had never realized the consequences of careless weighing, of inaccurate temperature corrections, and of the use of outdated charts. To sum up, we feel that due to increased knowledge of both operators of machines and consumers we have solved a great deal of our problem in Louisiana. With close cooperation between all States involved in this type of program, we feel that eventually there will be a unified system whereby everyone will conduct moisture meter testing in like manner.

MARYLAND

(Richard L. Thompson, reporting)

At the outset of this report, it should be noted that Maryland has not initiated an inspection program with any legal sanctions. Rather, our approach has been one of gathering data by following recommendations provided by the Office of Weights and Measures, other State jurisdictions and, more recently, by applying the requirements found in the draft of the Tentative Code For Grain Moisture Meters and as it appears in the 66th NCWM announcement.

Without the support of a specific law or the promulgation of regulations relative to grain moisture meters, no enforcement activity will be directed toward the meters. Recommendations for service, repair, procurement of charts, and operation/environmental changes are offered by representatives of this State's Weights and Measures Section.

A different approach is taken towards weighing devices, inasmuch as codes for those instruments currently exist. It is our intent to modify our position toward the moisture meters when a finalized code exists.

Maryland, as you know, is a small State; its agriculture is highly diversified. The combined production of grain, however, results in that industry being among the leading segments of agriculture. Nevertheless, only 176 to 180 meters are found to be in commercial use each year. Consistent with our other weights and measures efforts, this Section does not engage in the inspection and test of non-commercial devices of any kind. This report contains, primarily, the information relative to accuracy of 176 commercial meters. Other information is provided which may be of some small interest. Again, it is important to realize that the effort in 1981 was based on the draft of the tentative code presented at the 66th NCWM.

Four different varieties of grain were employed in the inspection of these meters: Barley (12.4% - 17.5% moisture), Corn (14.6% - 21.7% moisture), Wheat (13.6% - 18.8% moisture), Soybean (13.8% - 17.9% moisture). Of the 176 meters tested, only four were found to be in tolerance with all sample varieties used in the effort. One hundred and fifty-two recordings showed that the meters were indicating less moisture than the sample contained. Twenty-seven of the recordings showed that the meters were indicating more moisture than the samples contained. The total of 152 plus 27 is, obviously, 179; some meters indicated an out-of-tolerance condition with more than one sample variety. Thirty-four operators were found to have outdated charts, ten meters were found to be inoperative. Considering the latter, only 166 meters were actually tested. Again, the fact that some meters were out-of-tolerance on more than one sample variety accounts for the apparent disparity in the number of meters tested, versus the number of out-of-tolerance conditions.

It is interesting to note that an additional 33 meters would have been found acceptable, relative to tolerance, had the inspectors used the "Arkansas Chart" in their inspection of these devices. Further, a total of 128 meters would have been found acceptable, relative to accuracy, had the inspectors not employed high moisture (18% - 19%) wheat. Predominantly, meters recorded lower moisture levels than the samples contained.

For your convenience, a chart of the results is provided below. I trust this report will be of some interest to you and other members of the Task Force.

CHART OF RESULTS ON MARYLAND COMMERCIAL MOISTURE METERS

- A. Commercial Meters Inspected and Tested = 176
 B. Results under the following conditions:

	In Tolerance with all 4 sample varieties	Out-of-Tolerance on any of sample varieties (-)	27 (+)	Out-Dated Charts	Inoperative Meters
B.1. Using manufacturers' current charts, where applicable	4	152		34	10
B.2. Using "Arkansas Chart" for one manufacturer and some models of another manufacturer's equipment.	37	-	-	-	-
B.3. Without the Use of High Moisture (18-19%) Wheat	128	-	-	-	-

Samples:

Barley	12.4% - 17.5%
Corn	14.6% - 21.7%
Wheat	13.6% - 18.8%
Soybean	13.8% - 17.9%

MISSISSIPPI

(James Spencer reporting)

Update on Moisture Meter Laboratory located at Delta State University in Cleveland, Mississippi:

Number of samples	Oven test	Karl Fischer Titrator test
Soybeans	208	34
Soft red winter wheat	188	47
Long grain rough rice	168	44
Spanish peanuts	4	
Sunflower seed	2	
Moisture Meters	Tested-292	Rejected-14
Gram Scales	Tested-236	Rejected-7

MISSOURI

(J. W. Abbott reporting)

We have 656 locations with 895 meters. Our program is five years old. We have one lab technician and three field inspectors who check all locations annually and recheck major high thruput locations. They take three moisture levels and drop samples three times into each meter and compare results with the oven. We have expanded our program to milo, wheat, corn and soybeans.

We are experimenting with fescue, rice, and sunflower (oil & edible). We also wish to report a year long study by the Univ. of Missouri on a grant from USDA. Among other topics they are studying

- ° methods of keeping high moisture samples
- ° length of time a sample will last in the field, and
- ° induction of moisture into grain

We hope for results in computer form in the coming year.

NEBRASKA

(James Alloway conveyed Donald Kendle's report)

Statutory citation for meters: Section 89-1, 104 et. seq., Nebraska Revised and Reissued Statutes Cumulative Supplement 1980.

On May 13, 1959, the Nebraska Legislature passed L.B. 616, a moisture meter testing and inspection law. This was done at the request of the grain industry and the various farm organizations. The legislature placed the program under the supervision of the Nebraska State Railway

Commission, which was already supervising the Public Grain Warehouse Program. The Nebraska State Railway Commission later became the Nebraska Public Service Commission. The Nebraska moisture meter testing and inspection program was the first mandatory program in the United States.

In 1977 the law was inadvertently repealed and was corrected the following legislative year by the passage of L.B. 636 (moisture testing) on April 17, 1978. During the time the Public Service Commission was without a bill, they continued to inspect moisture meters for the people of Nebraska. Consequently, the State of Nebraska, under the Public Service Commission, has had a program for 22 years.

The Nebraska Public Service Commission policy requires all moisture meters in the State be inspected once each year. The grain trade may request additional moisture meter checks. The time factor on a "call in" is generally within two weeks. During 1980, 1,320 meters were initially tested. There were also 58 rechecks and 116 special requests, for a total of 1,494 checks.

When the program was started, approximately 35% of the machines inspected were rejected. This dropped to 25% the second year, to 15% the third year, and currently fluctuates, but does not exceed 14%.

The Nebraska Public Service Commission employs two inspectors. They are responsible for field testing, laboratory work, and related business for all of Nebraska.

The fee schedule for the services are \$7.50 for an original or request check and \$5.00 for a recheck (following the rejection of a machine).

The Nebraska Public Service Commission does not require or recommend a particular type of moisture meter. All meters must meet the state tolerance of ± 0.5 up to 22% moisture. For checking the meters, Nebraska uses a standard meter, grain samples, test pads, and test pellets. The tables, charts, conversion charts, etc., specified by the manufacturer, are used in testing the meters.

Any problems encountered are minimal and are those that are expected to be found in the environment and in soil variation and the large number of grains, seeds, and edibles, etc., raised in Nebraska: corn, milo, soybeans, wheat, oats, triticale, barley, rye, sunflower, safflower, millet, edible beans, popcorn, vetch, brome grass, and alfalfa pellets. At present, Nebraska is satisfied with the way in which the moisture testing is being handled in the State.

The draft on Grain Moisture Meters by the Task Force appears to be complete. The Nebraska Public Service Commission has for years been using nearly everything they propose. They differ only with the "Transfer Standards" and the "Tolerance Factor".

Mr. Alloway reported that Nebraska's transfer standards are meters of various brands and the proposed tolerance of the NCWM is larger than

Nebraska's tolerances as a result of the different transfer standards. Nebraska's moisture meter testing program is a part of the Nebraska Public Service Commission, not part of Nebraska Weights and Measures.

SOUTH CAROLINA

(John Pugh reporting)

We are happy to report that we have cooperated with Iowa State University and the National Bureau of Standards Office of Weights and Measures by providing copies of all moisture meter field test reports.

Six standard samples, three each of wheat and corn, were exchanged with USDA.

Ten corn samples were exchanged with the Department of Agricultural Engineering of the University of Illinois for research purposes. We conducted moisture tests by both the oven and Karl Fisher methods.

In a cooperative effort with industry to improve the accuracy of grain moisture measurement in South Carolina, we furnished Fred Stein Laboratories Inc. with field test data on most of their Steinlite meters for the purpose of updating charts.

Field meter test results as follows:

200 field meters were tested with standard corn samples and 10.0% exceeded the allowable tolerance of $\pm 1.25\%$ (August 1980)

222 field meters were tested with standard soybean samples and 5.4% exceeded the allowable tolerance of $\pm 0.75\%$ (November 1980)

161 field meters were tested with standard wheat samples and 9.3% exceeded the allowable tolerance of $\pm 0.75\%$ (June 1981)

TENNESSEE

(John Shelton reporting)

In July of 1980, Tennessee placed its first full time grain moisture meter inspector in the field. This inspector is responsible for all meter inspections in Western Tennessee where approximately 60% of the meters in the State are located. Since beginning his work this inspector has checked approximately 167 meters. Of this number, 21 were rejected (a 12.5% rejection rate). Scale and thermometer rejections have been minimal.

We are presently involved in training a meter inspector for both Middle Tennessee & East Tennessee. These inspectors will not be checking meters full time due to the limited number of meters in their respective

territories. Hopefully by late 1981 or early 1982, these two inspectors will have been properly trained and on the road. This will then give us 100% coverage of the State.

On the laboratory side, our lab technician has now assumed the laboratory function of this program. Presently we are conducting only oven tests. We hope to begin titration work as our technician gains more experience and knowledge in this area. We intend to become more active in exchanging samples with other States, USDA, and meter manufacturers depending on the amount of time our technician will be able to devote to laboratory aspects of this program.

We are presently involved in preparing corn, wheat, and soybean samples. As these 3 grains constitute the major portion of all crops grown in Tennessee, we intend to limit our sample preparation to these three grains.

As of now, we are hopeful an addition to our Weights and Measures Lab is imminent. This will greatly expand our grain lab and hopefully we will be able to obtain more laboratory equipment.

VIRGINIA

(Marion Cain reporting)

In Virginia, the Grain Bureau checks moisture meters, rather than Weights and Measures; they are licensed by FGIS to do official grading as well. Their procedures are based on meter to meter testing. Weights and Measures checks peanut moisture meters (208 meters, all Steinlite models). We test meters using pads and pellets and have compared this with samples run in the oven. We have found large discrepancies in one of the charts. We collected samples last year for testing this year but the samples do not appear to be sound.

Reports were also provided by several other organizations at the meeting.

ILLINOIS-IOWA MOISTURE METER TASK FORCE

(Lowell Hill reporting)

The following report is the joint work of Lowell D. Hill, Task Force Chairman and L. J. Norton Professor of Agricultural Marketing at the University of Illinois, Charles R. Hurburgh, Agricultural Engineering Instructor at Iowa State University, and Marvin R. Paulson, Assistant Professor in Agricultural Engineering at the University of Illinois.

Moisture meter manufacturers have completed the corn high moisture meter recalibration adjustments required by the Iowa and Illinois Departments of Agriculture and all commercial meters have been given tentative approval. New charts, modules, and meter adjustments were made available to users on August 1, 1981. Low moisture revisions (up to 22 percent moisture) were distributed to the Illinois and Iowa grain

industry in September of 1980. The low and high moisture changes in combination have reduced discrepancies among brands of meters and were established using the USDA moisture reference standard (103 °C, 72-hour whole-kernel air-oven method) as the basis for all State certified moisture measurement over the entire moisture range. Because electronic moisture meters actually measure electrical properties, not moisture, perfect correspondence among meters and the oven reference standard is not feasible. Variations among meters and corn varieties will still exist. However, the changes that have been made have dramatically improved the accuracy and comparability of most meters used by the grain trade.

The revisions were based on tests conducted on more than 1500 samples using the resources of Iowa State University, University of Illinois, Illinois Department of Agriculture, and Iowa Department of Agriculture, with assistance from Dickey-John Corporation, Fred Stein Laboratories, Motomco Inc., and Seedburo Equipment Co. A review of some of the data will indicate the improvement that has been made, the effect the changes will have on moisture readings, and some potential problems where neighboring States and national standards are using calibrations that differ from the Illinois-Iowa Task Force recommendations.

In Figure 1, estimates of the average difference that existed between the meter reading and the oven moisture using the calibrations available prior to September 1, 1980, are plotted against the oven moisture. The figure was constructed by using the 1980 samples and adjusting the meter readings according to the calibration existing at that point in time. The meters shown are the four major brands and models* in general use in the Illinois and Iowa grain industry. The vertical axis represents the average percentage points of moisture difference (bias) found when the oven-determined-moistures were subtracted from the meter moistures. A positive number (positive bias) indicates the meter was reading wetter than the oven; while a negative number (negative bias) indicates the meter was reading drier than the oven moisture determinations. It is apparent from Figure 1 that the differences between meter and oven moistures change as corn moistures change. Thus, meter accuracy varies depending on which moisture range is measured. There are fluctuations about the zero difference line for all meters because of the wide variability among individual samples with all electronic meters. A tolerance ± 0.5 percentage points was established in the 12-22 percent range for prototype approval by the Illinois Department of Agriculture. Figure 1 shows that a positive bias at the lower moistures and a negative bias at the higher moistures existed under the old calibrations. There are also large variations among meters at all moisture levels.

*Trade names are used solely for the purpose of providing specific information. Mention of a trade name, proprietary product, or specific equipment does not constitute a guarantee or warranty by the University of Illinois, Illinois State Department of Agriculture, Iowa State University, or Iowa State Department of Agriculture.

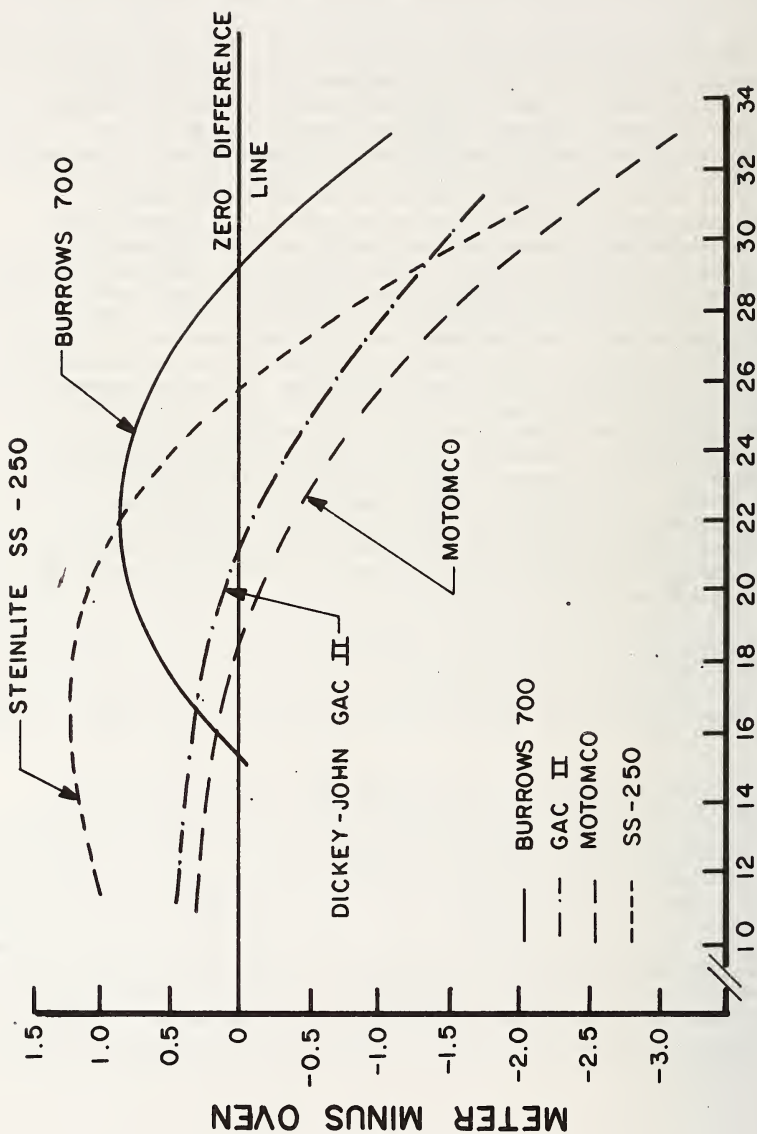
The recalibrations made in 1980 and 1981 improved both the accuracy of all meters and the comparability among meters (Figure 2). A few unusual data points still exist primarily due to a lack of adequate numbers of samples at certain moisture levels, and the increased variability that occurs as moisture levels increase. Since Figure 2 provided only an estimate of how the Fall 1981 calibrations would have affected the Fall 1980 corn, there exists a need for additional testing to further refine the calibrations. Figures 3 through 6 indicate for each meter the estimated meter moisture difference from the oven moisture prior to 1980, actual meter performance during 1980, and the estimated meter performance for Fall 1981 based on samples of Illinois-Iowa corn harvested in 1980. Examination of the figures provide considerable assurance that the changes made in 1980 and in 1981 have improved the accuracy and comparability of all meters against the oven standard.

Figure 3 shows that a change in the Burrows 700 calibration in mid 1980 reduced the average meter-minus-oven difference across the entire moisture range but negative bias was introduced at moistures above 28 percent. The 1981 calibration helped to bring the meter within tolerance. Figure 4 shows no change in the calibration on the GAC II below 22 percent. The 1981 change in calibration above 22 percent removed the negative bias and brought the meter within the required tolerance for prototype approval. The Motomco meter uses 3 difference charts to convert the meter reading to an estimated moisture. As shown in Figure 5, the C-1-C chart for moistures below 21 percent was unchanged. The C-2-D and C-3-B charts were replaced by C-12 and C-13 charts to meet tolerances required by Illinois and Iowa Departments of Agriculture. The serious negative bias above 25 percent was corrected. The remaining difference between oven and meter is centered at the break between the charts and may not exist when tested on a larger number of samples. The Steinlite SS-250 meter (Figure 6) shows a marked improvement with the 1980 recalibration and additional improvement with refinements introduced in 1981. A positive bias of nearly one percentage point at low moisture levels and a negative bias as great as two percentage points at 30 percent moisture have been corrected to a nearly zero bias from 12 to 28 percent moisture. The other Steinlite models are not shown in this report to minimize space requirements, but all showed similar improvement in accuracy.

Although the required recalibration for Iowa and Illinois eliminates a serious problem that has long existed in those States, it has created an additional problem for grain sold across State lines or on official USDA grades. Since the Iowa-Illinois calibrations for the Motomco meter have not been adopted by FGIS or by other States in the cornbelt, there exists the possibility that the moisture reading for any particular sample will differ among States. For example, an elevator buying high moisture corn on the official FGIS Motomco chart will record moisture levels 2-3 percentage points below an elevator using the Illinois-Iowa calibration chart (Figure 5). An official inspection using the Motomco C-2-D and C-3-B charts will obtain a lower moisture reading than the local elevator would show using any of the meters approved by the Illinois and Iowa Departments of Agriculture. It will be difficult for

the grain trade to operate with two sets of calibration charts: one approved by State agencies, the other approved by a Federal agency. While wet corn is not often inspected by FGIS there are several situations where these calibration differences will be important; for example, on a Federal appeal or a request for moisture determination by a Federally licensed inspection agency. Merchandizers purchasing wet corn on official grades will also face the problem of discrepancy between calibrations.

The Iowa-Illinois recalibration of all meters at the high moisture end of the range has widened the discrepancy between the official reading and all of the recalibrated meters. The solution is a national program requiring that all meters be tested against a single standard, the 103 °C 72-hour air-oven, using natural grain samples covering the entire moisture range. Minimizing average error across all moistures is not a sufficient test because large positive errors at one moisture may cancel negative errors at another. Two point intervals or less should be used in calibrations. Meanwhile grain buyers and sellers should make allowances for the discrepancies they will find when merchandising grain using the old (C-2-D and C-3-B) Motomco charts. Farmers must recognize that although the new high moisture calibrations will make their corn appear wetter than last year, the meter calibrations are more accurate than before. Farmers appeared to gain on the low moisture recalibrations in 1980; they appear to be losing on the high moisture recalibration in 1981 if they market high moisture corn. But it must be emphasized that nobody gains by using an inaccurate moisture meter any more than by using an inaccurate scale. The grain industry depends on the integrity of its equipment as well as the integrity of its buyers and sellers, to maintain a complex but efficient marketing system. An opportunity exists for improving our ability to measure more accurately the value of each load of grain. The industry should settle for nothing less than the highest level of accuracy our knowledge and technology can provide.



OVEN MOISTURE, PERCENT

Fig. 1. Estimated effect of corn moisture meter calibrations used prior to September 1, 1980 when applied to Illinois-Iowa 1980 corn.

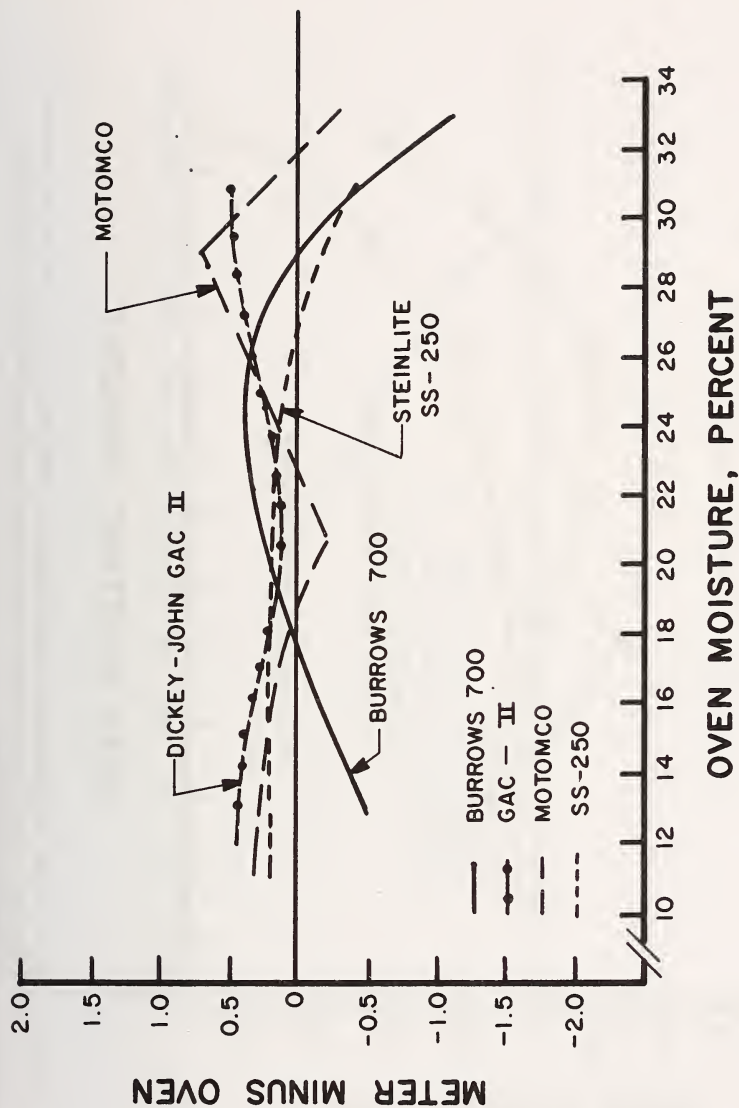


Fig. 2. Estimated effect of Fall 1981 corn moisture meter calibrations when applied to Illinois-Iowa 1980 corn.

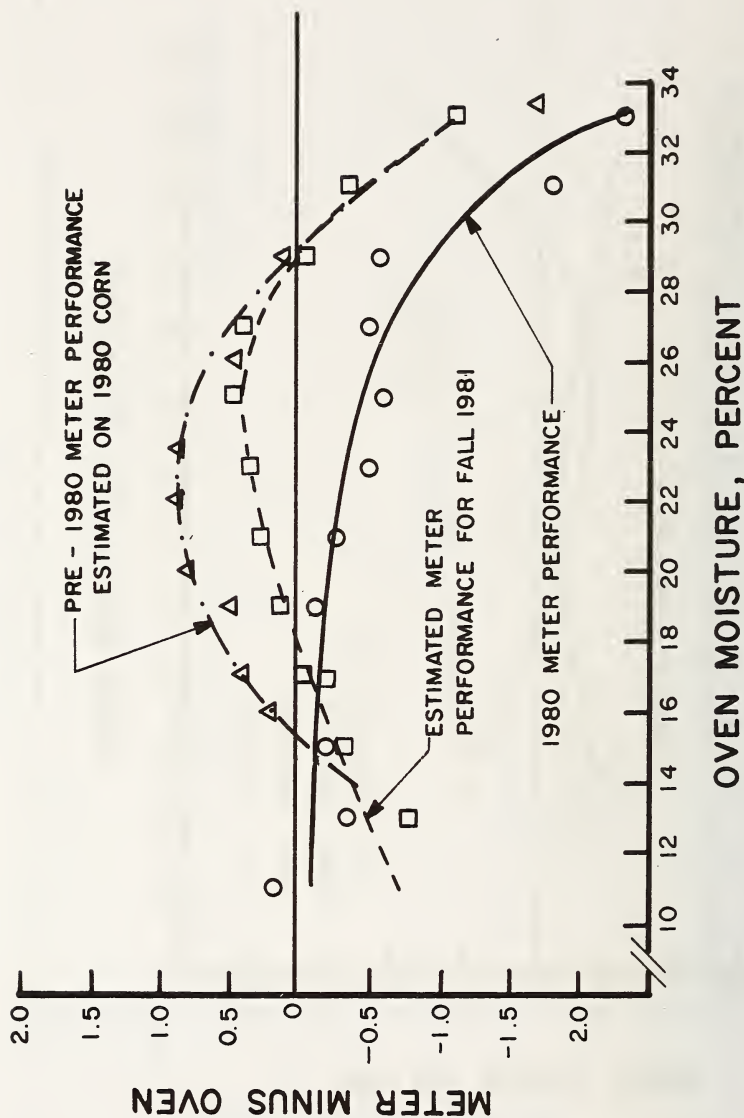


Fig. 3. Burrows 700 moisture meter performance on 1980 corn, estimated meter performance with Fall 1981 Illinois-Iowa calibrations, and pre-1980 meter performance estimated on 1980 corn.

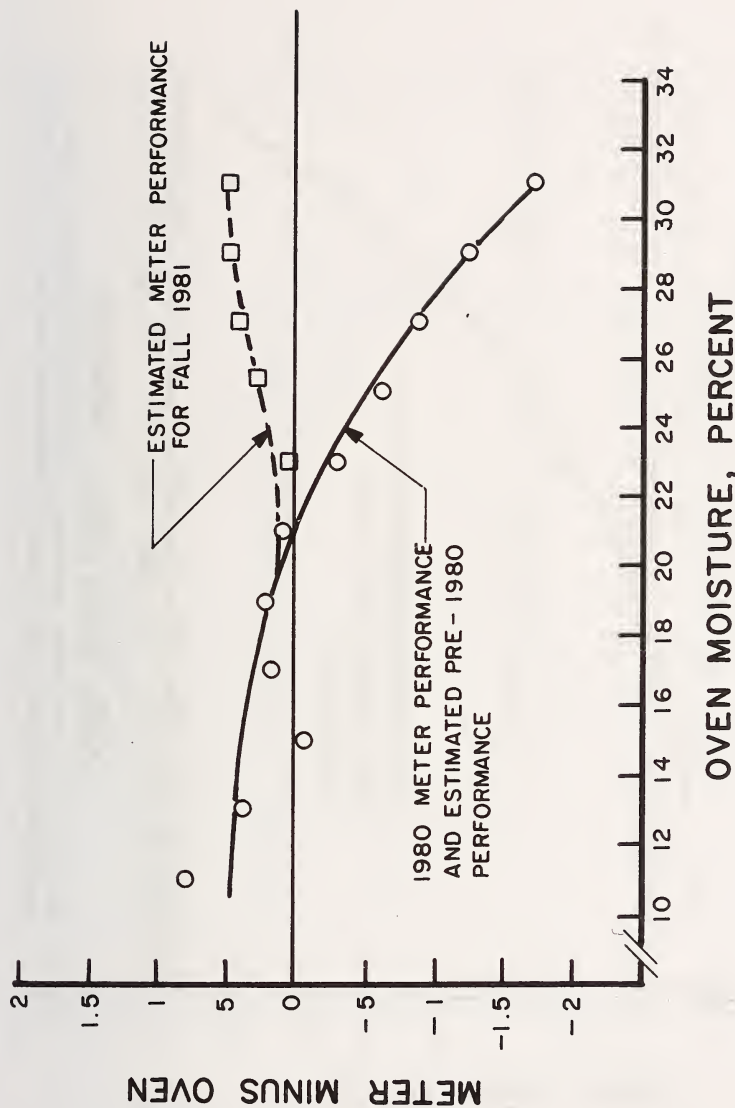
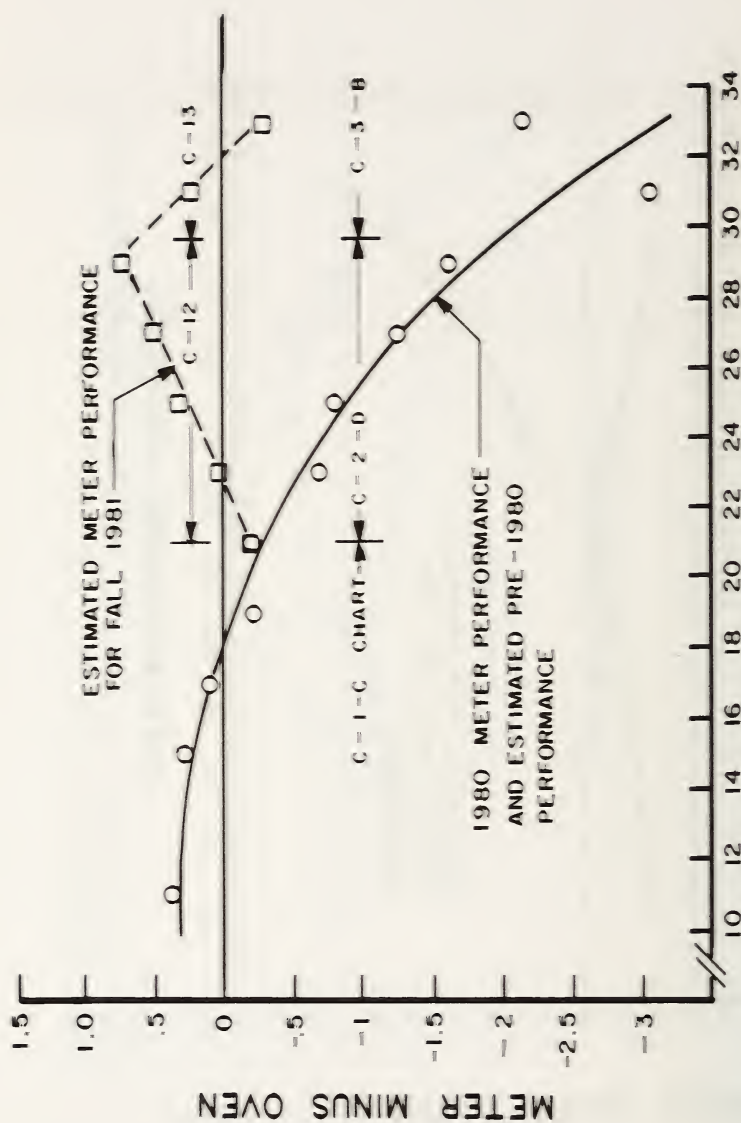


Fig. 4. Dickey-john GAC-II moisture meter performance on 1980 corn and estimated meter performance with Fall 1981 calibrations.



OVEN MOISTURE, PERCENT

Fig. 5. Motomco 919 moisture meter performance on 1980 corn and estimated meter performance with Fall 1981 Illinois-Iowa Motomco charts.

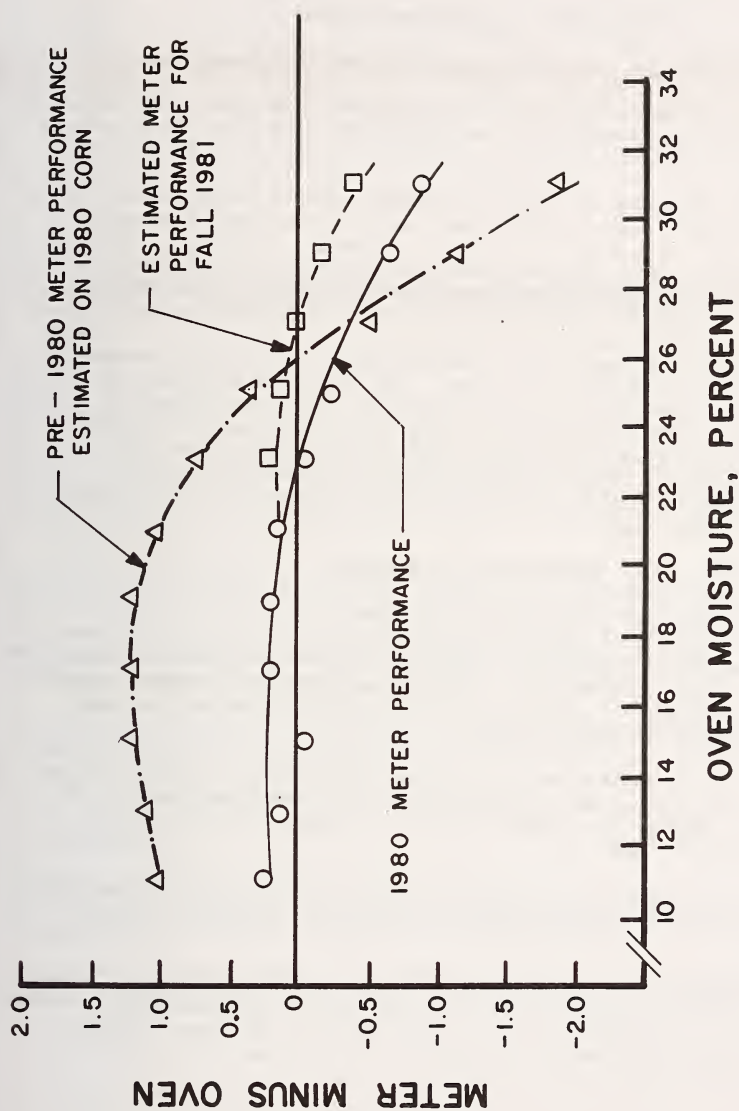


Fig. 6. Steinlite SS-250 moisture meter performance on 1980 corn, estimated meter performance with Fall 1981 Illinois-Iowa calibrations, and pre-1980 meter performance estimated on 1980 corn.

Editor's Note: Subsequent to Dr. Hill's report, the Federal Grain Inspection Service issued (on August 14, 1981 Notice 81-41) tentative corn moisture conversion charts for the Motomco Moisture Meter for corn with moisture in excess of 21.08%. These charts are those adopted by Illinois and Iowa based on the work reported above.

FEDERAL GRAIN INSPECTION SERVICE

(Floyd Nierenberger, Clifton Watson, and Joe Giannina reported)

The FGIS transmitted by letter its comments on Section 5.56, Tentative Code, Grain Moisture Meters, as presented in the Announcement Program for the 66th NCWM.

Dr. Watson reported on work his research group has been conducting on electronic modifications to the Motomco meter and studies on the basic reference method including Karl Fischer, vacuum oven, and P_2O_5 . He also announced a draft of performance specifications including testing methods for meters and other equipment and the ongoing work to keep 88 FGIS charts up to date. He thanked those States that contributed samples to his lab and asked that States continue if at all possible. Dr. Watson also reported oven exchanges with several States and suggested that this program needed to expand to more States. Mr. Giannina reported on work the Equipment Testing Group is carrying out to check test the 600 meters owned by FGIS. They are searching for ways to test the meters without using grain samples; ideally they want an unchangeable inert material. Currently, FGIS uses dry hard red winter wheat which is delivered into the Motomco in three different weights to simulate three different moisture levels.

DICKY-JOHN CORPORATION

(David Funk reported)

Mr. Funk reported that his company is involved with recalibrations based on Illinois and Iowa data. He said that data other States supplied were useful only if they were provided in some raw meter reading form (rather than final moisture content).

Natural grain sample testing programs may be ideal, he said, but not all States are able to carry such programs out. Therefore, details of each State's programs are needed in order to decide whether cross comparisons can be made.

There may be varietal or regional differences for grain in the U.S., he warned, that will not permit meter accuracy to be improved beyond a certain point with national charts.

He said that one very important conclusion to come out of the Illinois/Iowa Task Force meetings which the National Task Force should keep in mind is that it is ultimately the responsibility of the meter manufacturer to calibrate his meter and keep his calibrations up to date.

THE ACTIONS OF THE NATIONAL TASK FORCE AND FUTURE PLANS

The National Task Force on Grain Moisture Measurement of the National Conference on Weights and Measures has established three goals:

1. The adoption by Weights and Measures officials of uniform laboratory and field test procedures to be used to test grain moisture meters. We are making progress, however, there is much to be done. We especially want to thank FGIS and the participating States for their contribution.
2. To evaluate the capabilities of moisture meters in order to set reasonable tolerances on the meters. Information provided by several States has been valuable in developing reasonable tolerances for the Tentative Code for Handbook-44. A special thanks to Dr. Hill and the Illinois-Iowa Task Force for their contribution relating to corn.
3. To develop a Tentative Code for Grain Moisture Meters to be included in Handbook-44. A Tentative Code has been developed and is ready for review during the interim meetings in January, 1982.

Prior to and during the interim meetings in January, 1981, the Task Force met repeatedly and at length. As a result, the Task Force recommended in July 1981 that the Tentative Code be formally submitted to the Specifications and Tolerances (S & T) Committee for consideration and action at the interim meetings in January, 1982. We expect a recommendation from the S & T Committee to the NCWM for action in July, 1982. If approved by the Conference, the Code will be included in Handbook-44 with an effective date of January 1, 1983.

The Draft is intended to permit the use of most types of grain moisture meters presently used in commerce. However, the Task Force goes on record strongly advocating automatic devices. The Task Force encourages the incorporation of temperature sensing equipment, grain sample quantity measurement equipment, and direct read-out mechanisms into the meters in order to reduce the potential for misuse or fraud.

During the meeting of the Task Force at the Annual NCWM, it became evident that problems existed relating to two areas:

1. Policy or Administrative
2. Technical

In order for the Task Force to deal with these areas more effectively, and to promote activity within the Task Force, the Task Force considered reorganizing itself into a policy and technical group.

The National Task Force with Sam Hindsman (Arkansas) remaining as Chairman, Dr. James Driscoll (FGIS), Sid Colbrook (Illinois), Leo Letey

(Colorado), James O'Connor (Iowa), Richard Thompson (Maryland), and Dr. Carroll Brickenkamp (NBS) will continue to serve as the policy working group.

Suggested Issues:

1. Preparation and updating of charts.
2. Relationship between FGIS and States.
3. Relationship between Meter Manufacturers and State programs.
4. Relationship between Task Force and Industry.

Sid Colbrook (Illinois) has been asked to chair a Technical Working Group, members to be determined at a later date.

Suggested Issues:

1. The use of grain samples as a reference standard.
2. Tolerances
3. Reference methods
4. Prototype procedures

The Technical Group will make recommendations to the National Task Force for consideration and final action.

The National Task Force and FGIS are planning a 3-day seminar during the month of February, 1982. Final plans have not been completed. We are planning to invite laboratory, field and administrative personnel from the participating States, meter manufacturers, and the technical group of the task force to the meeting.

Suggested Issues:

1. Review States' methods in field and laboratory procedures.
2. Review the FGIS methods in field and laboratory procedures.
3. Provide sample program to FGIS.
4. Discuss check tests from the FGIS.
5. Care and maintenance of moisture meters--provided by meter manufacturers.
6. Review S & T Tentative Code.

It is the opinion of the Task Force that we must have a uniform and coordinated effort to assure greater meter accuracy in the market place. Ultimately, the development of national charts for all grains is desired. The use of State and regional charts will provide valuable information in the developing stages.

It is the intention of the task force to continue to coordinate deliberations and other activities with the International Organization of Legal Metrology (OIML). The task force does not have plans for drafting a model regulation for Handbook 130 at this time.

E. C. HEFFRON, Michigan, Chairman
 C. R. CAVAGNARO, U. S. Office of Consumer Affairs
 C. E. FORESTER, Texas
 K. J. SIMILA, Oregon
 M. S. THOMPSON, Chadwell, Kayser, Ruggles, McGee, and Hastings, Ltd.
 S. HASKO, Technical Advisor, NBS
 H. F. WOLLIN, Executive Secretary, NCWM

Committee on Liaison

(On motion of the committee chairman, the report of the Committee on Liaison voting key items 500 through 505 was adopted in its entirety as amended by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the executive secretary to make any appropriate editorial changes in the language adopted by the Conference.)

VOTING RESULTS--Committee on Liaison

Voting Key	House of State Representatives		House of Delegates	
	Yes	No	Yes	No
501	41	0	45	0
502-1	28	12	41	4
502-2				
502-3				
502-4				
502-5	41	0	45	0
502-6				
503				
504				
505				

REPORT OF THE EXECUTIVE COMMITTEE

Presented by EDWARD H. STADOLNIK,
Conference Chairman, Director, Division of Standards,
State of Massachusetts

(Thursday, July 16, 1981)

VOTING KEY

600

INTRODUCTION

The Executive Committee submits its final report for consideration by the 66th National Conference on Weights and Measures.

The following items were initially referred to the P & C Committee and the appropriate standing committees at the interim meeting in January and were subsequently referred to the Executive Committee for its consideration.

Some of these matters had been introduced by the Nominations Committee in its report to the Conference last year. Several other matters pertaining to concepts for the possible reorganization of the NCWM were presented by Mr. Albert D. Tholen, Chief, Office of Weights and Measures, National Bureau of Standards.

Although the NMPC did not have sufficient time to fully explore all matters in great detail, it was determined that there are two distinct areas that should receive some immediate attention for improving the basic organizational structure at the Conference. These two areas are covered in items 601 and 602. Information and recommendations on other matters will follow later in this report.

601 NATIONAL MEASUREMENT POLICY AND COORDINATION COMMITTEE

During the interim meeting, it became quite evident that the present structure of the National Measurement Policy and Coordination Committee leaves little opportunity for the Committee, as a whole, to meet and discuss the issues on its agenda. The NMPC is made up of the chairman of the Conference and the chairmen of the four standing committees. Due to the extremely tight schedule that each standing committee chairman has with his own particular agenda, little time is available for them to meet jointly to participate in the meetings of the NMPC. The chairman of the Conference should also have an opportunity to participate in the work of the standing committees so that he may obtain a firsthand perspective of the significant issues that are facing the Conference. It is therefore recommended that the National Measurement Policy and Coordination Committee be eliminated from the Conference structure.

It is also recommended that the functions of the National Measurement Policy and Coordination Committee be assigned to a newly organized

Executive Committee which will play a more active role in Conference proceedings and function as a more effective policymaking body. The committee wishes to point out that under the terms of this proposal, the effective date for the elimination of the National Measurement Policy and Coordination Committee will be after the adjournment of the 67th National Conference on Weights and Measures in July of 1982.

(Item 601 was adopted)

602

EXECUTIVE COMMITTEE

Under the present structure of the Conference, the Executive Committee meets only at the beginning and close to the annual meeting of the National Conference. It was recommended by the National Measurement Policy and Coordination Committee that the Executive Committee be restructured and its role be expanded to include the functions of the present National Measurement Policy and Coordination Committee. This would provide for an Executive Committee that would meet more regularly and assume a more active stance in Conference policymaking. The following is being recommended as the structure of the Executive Committee of the Conference:

Executive Committee

Conference Chairman

First Vice-Chairman

Second Vice-Chairman

Immediate Past Chairman

Four Chairmen of the Standing Committees

Four Presidents of the Regional State Weights & Measures Associations

This would provide for a 12 member Executive Committee and would provide for greater participation by Executive Committee members in the discussion of policy matters that are agenda items as they would meet at both the interim meetings and at the annual meetings of the Conference. It would provide for a Conference Chairman who has moved up through the Chairs from Second Vice-Chairman to First Vice-Chairman to Conference Chairman. This would give the Conference Chairman prior experience in dealing with matters relating to the Conference and provide a continuity of Executive Committee membership. The inclusion of the Past Chairman would, also, provide for continuity of participation. The four chairmen of the standing committees would be able to provide input relating to current agenda issues, and the four presidents of the regional weights and measures associations would provide the necessary regional representation and interaction between their individual associations and the National Conference.

The Executive Committee is proposing this organizational change for approval at this year's Conference; and if approved, the first step in its implementation would be taken during election at the 1982 Conference. This schedule would give the Nominations Committee sufficient time to prepare a slate of candidates who would, if elected, begin to serve at the 1983 National Conference. In the first year (1982) there would have to be the election of the Conference Chairman, First Vice-Chairman, and Second Vice-Chairman. In subsequent years, only the Second Vice-Chairman would have to be elected as there would be the normal moving through the chairs.

The committee recognizes the need to outline the duties and responsibilities of the proposed Executive Committee and of the officers should this proposal be adopted. It is recommended that this need be met by Conference action at the 67th NCWM.

(Motion to amend was defeated. Item 602 as proposed was also defeated.)

603

CONCEPTS ON INSTITUTIONAL GROWTH OF NCWM

In addition to the organizational changes recommended in 601 and 602, Mr. Tholen's presentation suggested several other organizational and procedural changes for consideration by the NCWM membership in the future. These changes, derived from comments from many sources, were presented as a package. His talk is included here to stimulate broader consideration and involvement in the affairs of the NCWM. During the open hearing it was made clear that these thoughts were intended to stimulate our thinking and their endorsement is neither solicited nor needed.

The leaders of the National Conference and the staff in my office have heard concerns about our collective ability to deal with rapidly increasing agenda items relating to weights and measures programs in the States and throughout the Federal Government. What I'm going to suggest today are really culminations of attempts to address the mechanism now employed, and to suggest organizational and procedural changes in the National Conference and the four regional associations which could bring more talent, investigation, and management to the handling of issues. Organizations and procedures exist. By integrating the treatment of the issues, the combined effectiveness should greatly increase with little additional cost in time or funding.

I invite you to reflect on two goals which I set out as perhaps overall goals related to this area. First, I believe we need to do a better job in identifying the issues in the '80's. Again I believe we need to approach our work on a longer time basis and with better anticipation and insights than we have in the past. The second

goal I would like to address today, is to develop a plan for evolution of the National Conference as an instrument of needed change in our system. These two goals, of course, are interrelated: to the extent that we anticipate the issues, we can then design the conference mechanisms to address those issues. If we can't do the first, we probably will not do a very good job of the second.

Observations

Let me suggest by way of some observations insights that might aid us toward an evolutionary set of changes in the organization and procedures of the National Conference.

- o Laws and regulations really apply to and must be considered by all the committees of the Conference in their deliberations.
- o The Liaison Committee does not seem to have a full and challenging agenda.
- o The Specifications and Tolerances Committee is over extended and perhaps needs more focus and help.
- o The Executive Committee does not have substantive and challenging work to do.
- o The Policy and Coordination Committee is rather redundant in that it is made up of the chairmen of the other committees.
- o We need to bring more "outside" guidance and assistance to the functions, study, and deliberations of the Conference committees.
- o We need to do a more deliberate organizational job of integrating (or coordinating) the activities of the Regional Committees with those of the National Committees.
- o In total, of the vast body of constituencies and talented individuals in the weights and measures arena, there are too few involved.

Those, then, are some general observations that I think can be used as a basic for extrapolating some ideas for institutional changes in the National Conference.

IDEAS FOR CONSIDERATION

Build Capabilities of Regionals

The four Regional Conferences offer a tremendous base of talent, interest, and need. In many cases the viewpoints of the four Regionals are similar; in other cases, they differ because of the uniqueness of regional commerce, industry, business, and agriculture. It is my premise that these regionals have much more to offer in terms of National deliberations than we have taken advantage of to date. I believe we need to work more closely with the four Regionals to help them build their institutional capabilities, and to help them and their committees address the issues rather thoroughly in their regions leading to recommendations and inputs to the National Conference.

Coordination of Business

We in the Office of Weights and Measures propose to develop a data base of major issues of the 80's. As action or information is developed related to these issues, those major actions will be introduced into the data bank. At the appropriate time when the Regionals are planning their committee meetings or annual meetings, we in OWM will provide them with the latest information from that data base for their use in developing agenda items. The result of the action taken by the Regionals in addressing these issues would be contained in reports produced by the committees of the Regional associations and summary material would be entered into the data bank to be available for use by these committees and the National committees at future meetings. What we are attempting to develop then is identification of the issues of the 80's in a data base whereby study and addressing of those issues can be scheduled, tracked, and a consensus sought for final deliberations at the National level.

Revision of Relationships

Perhaps we might even want to consider more formal relationships among the four Regionals and with the National Conference in terms of bylaw changes. For example, in time, would it make sense to reorganize the Regionals and the National so that the Regionals are, in fact, sectors of the National Conference with common bylaws, dues, and operating funds. Such a concept would perhaps open the door to provide support to the Regionals to "beef-up" their administrative support.

Build Membership

We can, in OWM, continue to endorse and promote the membership plan which was introduced in January of 1980 and which now number over 1300 members. We continue to view the National Conference on Weights and Measures as a professional association that is seeking to bring to its ranks, in terms of membership, full representation from State and local weights and measures jurisdictions, industry, business, agriculture, and Federal agencies involved with us.

Realignment of NCWM Committees

Now I'd like for us to consider possible committee realignments. At the present time, the Conference Committee alignment includes the following standing committees: Laws and Regulations, Specifications and Tolerances, Education, Administration, and Consumer Affairs, and Liaison. In addition, we have the aforementioned Policy and Coordination Committee, and the Executive Committee.

Let me suggest that this committee alignment might be changed to provide fewer standing committees each with a number of subcommittees, task forces, or study groups. Let me further suggest (and I will further elaborate later) that these subcommittees would bring additional membership to committee participation from State and Federal weights and measures jurisdictions, business, industry, agriculture, and Federal Government agencies.

A suggestion is that the current four standing committees be replaced with three standing committees: (1) the first dealing with all aspects dealing with commodities; (2) one dealing with technology and devices; (3) a third dealing with administration and program management.

What we are suggesting then are three standing committees: (1) Marketing and Commodities Regulations; (2) Technology and Device Requirements; and (3) Administration and Program Management.

It is further recommended that a truly policy oriented Board of Directors be established which would include members who are leaders in industry, State government, and Federal Government. Such a Board would bring additional National recognition to the Conference and assist it in establishing policy of a National nature. Such a Board would essentially replace the Policy and Coordination Committee and certainly the Executive Committee.

Next I'd like to talk about the committee set-up and committee membership. Each standing committee would continue to have five members appointed from the active

membership (State and local weights and measures officials). Each member would serve a five year term. Each year one member would retire and a new member would be appointed. (I believe the Conference should consider the possibility of including on each standing committee one representative from each of the four weights and measures associations, and a fifth at large member who could be an associate member of the Conference).

Each standing committee could establish a number of subcommittees to serve some broad area, special interest, or specific activity that falls within the scope of the parent standing committee. A subcommittee could consist of no less than three members and perhaps as many as ten members. I would suggest that one member at least of the standing committee would be assigned to membership of the subcommittee. All other members of the subcommittee would be selected from the active and associate membership (perhaps a majority should be made up of active members).

The subcommittees should serve at the direction of the standing committees. A subcommittee would not be established for a fixed period; however, its duration would be expected to exceed two years. They essentially would address long range issues and problems. A subcommittee could be terminated at an annual meeting of the National Conference if the Conference, at the recommendation of its parent standing committee, felt that its work had been completed.

Subcommittees would be responsible for performing studies, deliberations, and activities as assigned by the standing committee or as the subcommittee itself would think necessary. However, it would submit its agenda to the standing committee for review, comment, and approval. The subcommittee would report its findings and recommendations to the standing committee. It would carry out its work through correspondence, telephone contact, and attendance at National, regional, State, industry, and association meetings and conferences.

Task forces or study groups could also be established to meet specific and narrow and well defined issues or problems. In general, I would think the same organizational requirements and procedures applicable for subcommittees would be used to establish and operate task forces and study groups.

Now I would like to talk in very general terms about the three major proposed standing committees. First, the Administration and Program Management Committee might consist of three subcommittees: (1) Training and Education, (2) Program Development and Justification, and (3) Program

Review and Evaluation. This committee might also oversee the activity of the Enforcement Uniformity Study Group which has recently been established by the National Conference.

The Technology and Device Requirements Committee might form three subcommittees: (1) Scales-Weighing Systems, (2) Meters-Fluid Measurement, and (3) Laboratory Metrology. It might also be the parent committee of the task force on National Type Approval. (However, one might consider the Administration and Program Management Committee as a more appropriate parent of this Task Force at this point in its activities).

The Marketing and Commodities Regulations Committee might have two subcommittees: (1) Packaging and Labeling, (2) Packaging Technology and Inspection. It might have two task forces: (1) the existing Grain Moisture task force, (2) a new task force dealing with Net Weight.

NCWM Committee Procedures

Next I'd like to talk about committee procedures. We have had a lot of comments and recommendations in this area both from State, county, and city officials and from the associate membership. A couple of observations are: (1) the annual meeting of the National Conference attempts to handle too much business. The days beginning with breakfast meetings and ending with evening sessions are just too long. The question arises "are there ways to reduce the detail deliberations and activities of the annual meeting?" (2) There has been much comment about the practice of hearings at the National Conference resulting in changes (in some cases considered major) in the standing committee reports originally developed as a result of the interim meeting of the prior January. There is much feeling that the so called last minute changes cannot be adequately handled and studied by either the active or associate membership.

So it is with these major comments in mind plus other varied and minor comments that I would suggest consideration of changes in procedure. First, addressing the interim meeting, it has been proposed that each standing committee holding its interim meeting (presently during the month of January) for the purpose of discussing issues and proposals on its agenda should continue to hold open meetings inviting all interested parties to contribute their points of view. The announcement of these scheduled interim committee meetings should be sent out to all interested parties, and the agendas should be backed up by information from the

data bank that I proposed earlier. Therefore, the committee agendas and appropriate related information will be included with the announcement of the interim meetings. Through the use of the data bank, each standing committee could maintain a complete and updated listing of issues and discussion items including (1) date the issue or topic was added to the agenda, (2) the current status, and (3) the target date for resolution or completion of study analysis recommendation.

As a result of the committee meeting in January the previous practice of publishing tentative committee reports in the Conference Announcement Booklet will be changed to publishing final committee reports. The practice of holding open hearings on these subjects again at the annual meeting in July will be ended. Preparing final reports under the midnight oil during the annual meeting will be over. Voting on the final reports at the National meeting in July would be based on the final report issued by the interim committee meetings. In summary then: (1) following the interim meeting, the standing committees would publish their final reports in the Conference Announcement Booklet. Certain items in this report will be recommended for study preparatory to action (that is voting) at the annual meeting. Other items would be included for information, discussion, and further study at the meetings of the Regional associations and the National. (2) All parties will, therefore, have an opportunity to study the final reports, develop their State or business or association position over a period of several months, and be prepared to vote at the meeting of the National Conference in July.

At the meeting of the National Conference in July, each committee would hold an open meeting to explain its recommendations to those interested prior to voting. Voting would take place at the annual meeting in July, adhering to the conference voting system presently in effect.

The principal purpose of these changes in committee procedures is to improve the quality (that is the clarity and substance) of input of proposals to the standing committees as well as to provide greater time for all concerned to deal with these issues. In general, an issue will require a minimum of one year's processing through the meetings of the Regional committees and the interim committee meetings of the National Conference. This procedure will allow each Regional association as well as industry groups or associations to study these issues prior to the Conference addressing them, and to provide consensus positions of their membership to the Conference committees. This procedure will highlight the importance of the Regional associations in the whole process.

Associate Membership Participation

Proposals have been received from the associate membership calling for greater involvement in the work of the committees, program planning, and conference activities. The changes in the Conference organization and procedure as proposed today should meet the needs and interest as expressed by the associate membership. I believe the Associate Membership Committee is properly structured now to provide the necessary members, advisors, and general coordination activity within the Conference organization. Only the assignment of the associate members to the specific subcommittees and as advisors to the standing committees is needed to implement these proposed changes.

Summary

Let me summarize by suggesting some overall objectives that might be attained through changes in our present mechanism of addressing issues. First I think many of these recommendations would enable us to handle our growing workload more efficiently and thoroughly. I believe it is important to take advantage of the talents and interest and opportunities provided through fuller participation by the four Regional weights and measures associations. I believe that these changes would allow us to focus the activities of the National and Four Regionals toward common goals and objectives. Some of the recommendations would allow us to broadly increase the participation of talented and interested parties from both the active and associate memberships of the Conference in the study and deliberations of the Regionals and the National Conference. I believe that in time these changes would allow us to focus on the longer term issues with less reacting and more anticipatory planning. And, overall, I believe that these changes will emphasize and build the concept of professionalism in weights and measures.

(Item 603 was adopted)

604

FORMAT FOR PROPOSALS TO NCWM COMMITTEES

The Executive Committee wishes to follow up on its recommendations pertaining to proposals to NCWM committees that were adopted last year. These recommendations included policy guidelines on the general content of information and material submitted to committees as proposals for consideration as follows:

- 1) Proposals to be considered by a committee for action during the upcoming Conference shall be presented in writing to the committee sixty days prior to the interim meetings.

- 2) Proposals should contain a concise statement of the problem and clearly outline the purpose and national need for its consideration.
- 3) Proposals should include the submission of adequate background material including test data, analysis of test data, or other appropriately researched and documented material from which a committee will be able to make a suitable judgment for either a firm recommendation or to consider the need for further study. When possible, solutions to problems shall be proposed and stated in specific language in amendment form to Conference documents.
- 4) Weights and measures officials are encouraged to utilize their regional associations for initial exploration of issues and to use the resources of all member States within that regional association to assist in the development of well documented proposals where applicable.
- 5) If a proposal involves a new area of weights and measures activity, it would be appropriate to make recommendations for both regulations and test methods to provide for proper enforcement.

The Executive Committee now recommends additionally that when proposals are introduced to NCWM standing committees and these proposals would modify or add to existing publications (such as NBS Handbook 130 or NBS Handbook 44), the proposal should:

- o Identify the pertinent portion, section, and paragraph of the existing publication (i.e., Model State Method of Sale of Commodities Regulation, Section 8.2, paragraph (b); or Scale Code, Section S.2.1.2.(a)).
- o Where applicable, provide evidence of consistency with other portions of NCWM publications (such as with other model State laws and regulations).
- o Where applicable, provide evidence of consistency with Federal laws and regulations (such as with FDA or FTC regulations).

605 THE INSTITUTE FOR WEIGHTS AND MEASURES

The National Conference on Weights and Measures received a written invitation from Thomas M. Stabler, President of The Institute for Weights and Measures, to occupy a permanent chair on its Board of Trustees. Literature provided to the Committee indicated that the Institute for Weights and Measures is a nonprofit, educational institution incorporated within the State of Ohio. It also stated that the purpose of the Institute for Weights and Measures is to provide educational opportunities for weights and measures officials, industry personnel, users of commercial weighing and measuring equipment, and consumers. Committee discussions disclosed the Committee feeling that

it would be appropriate for the National Conference on Weights and Measures to provide its cooperation with an organization that had a basic purpose of attempting to develop training mechanisms in the field of measurement. Dr. Edward Heffron of Michigan, who currently serves as Chairman of the Liaison Committee, indicated that he would accept the responsibility of serving as the NCWM trustee to the Institute for Weights and Measures. Dr. Heffron currently serves as an Institute for Weights and Measures trustee representing the State of Michigan.

(Item 605 was adopted)

606

REPORT OF THE ASSOCIATE MEMBERSHIP COMMITTEE

Tom Stabler, Committee Chairman, reported that the Associate Membership of the National Conference on Weights and Measures is sponsoring the Conference Outing at Grant's Farm, St. Louis, Missouri, July 14, 1981. Sponsors of the outing include 76 companies, individuals, and agencies who have provided financial support for this event and will serve as hosts at the Anheuser-Busch estate.

The Associate Membership Committee once again approaches the National Conference concerning the involvement of associate members in the activities and deliberations of the Specifications and Tolerances Committee, Laws and Regulations Committee, and Education Committee. The Associate Membership of the Conference consists of individuals having outstanding expertise and talent who could assist the NCWM committees and programs effectively. The Conference could more fully utilize the capabilities of these persons. The Associate Membership Committee looks forward to assisting the National Conference during the next year and again sponsoring the industry reception in Atlanta.

(Item 606 was adopted)

607

NFW BUSINESS

- 1) Future Conference Sites - Plans are proceeding to hold the Conference at the following locations:

1982 - Atlanta, Georgia; 1983 - Sacramento, California;
1984 - Boston, Massachusetts; 1985 - Washington, DC; 1986 -
Denver, Colorado

- 2) 1982 Interim Meetings - Plans and arrangements have been made to hold the Interim Meetings as follows:

Location: National Bureau of Standards, Gaithersburg,
Maryland

Date: January 25-29, 1982

Schedule and Agenda: To be mailed to NCWM members in the
form of an Announcement Booklet by December 15, 1981.

- 3) 1982 - 67th NCWM - Atlanta, Georgia - The following arrangements have been made:

Hotel: Marriott

Dates: July 11-16, 1982

Rates: To be determined

The Weights and Measures Department, State of Georgia, and many others in Atlanta have extended their friendship and helping hand to make next year's Conference an outstanding event.

- 4) NCWM Income and Expenses - Because of the continuing escalation of Conference expenses and the desire to expand NCWM programs and involvement of Conference members in the work of committees, the Executive Committee strongly recommends that the elected officers of the 67th NCWM study ways and means for obtaining additional funding to meet the future needs of the Conference.

(Item 607 was adopted)

E. H. STADOLNIK, Massachusetts, Conference Chairman
R. ANDERSEN, New York
T. F. BRINK, Vermont
L. D. HOLLOWAY, Idaho
J. M. O'CONNOR, Iowa
J. L. O'NEILL, Kansas
N. M. ROSS, City of Omaha, Nebraska
D. SMITH, North Carolina
K. PETITTE, City of Chicago, Illinois
J. SHELTON, Tennessee
E. J. STEPHENS, Utah

Executive Committee

(On motion of the committee chairman, the report of the Executive Committee voting key items 600 through 607 was adopted in its entirety by the Conference. The results of the voting in the House of State Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows. The Conference also authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, provided that the requirements thus adopted are strictly adhered to.)

VOTING RESULTS - Executive Committee

Voting Key	House of State Representatives		House of Delegates	
	Yes	No	Yes	No
601	33	0	45	3
602A	39	0	18	22
602	25	14	27	26
603	42	0	61	0
604				
605				
606	43	0	56	0
607				

A = Amendment

REPORT OF THE RESOLUTIONS COMMITTEE

Presented by EDISON J. STEPHENS, Chairman
Supervisor of Weights and Measures, State of Utah

Thursday, July 16, 1981

VOTING KEY

700

INTRODUCTION

The Resolutions Committee wishes to express the appreciation of the 66th National Conference on Weights and Measures to each and every one who contributed their time and talents towards the arrangements for, the conduct of, and participation in this National Conference.

701

SPECIAL THANKS

The Conference gives a special vote of thanks to:

- 1) All speakers of the Conference for their expertise, information, and contributions to the program.
- 2) All officers and appointed officials of the 66th National Conference on Weights and Measures for their assistance and service towards a very successful Conference.
- 3) All committee members for their time and efforts throughout the past year to prepare and present their reports.
- 4) The governing officials of the State and local jurisdictions for their interest and support in weights and measures administration in the United States.
- 5) Representatives of business and industry for their cooperation, assistance, and hospitality.
- 6) Consumer representatives, members of the public media, and other participants who have shown their interest and support for the National Conference on Weights and Measures.
- 7) The staff of the Stouffer's Riverfront Towers for their fine facilities, assistance, and courtesies which contributed to the enjoyment and comfort of the delegates.
- 8) To the National Bureau of Standards and the Office of Weights and Measures for planning and conducting the work and program of the National Conference on Weights and Measures.

(Item 701 was adopted)

RESOLUTION ON THE REVIEW OF
NBS ORGANIC ACT

WHEREAS: The voluntary standards of Laws and Regulations are one of the primary products of the National Conference on Weights and Measures, the long term goal of which is essentially the same as part of the National Bureau of Standards Organic Act which states: "...securing uniformity in weights and measures laws and methods of inspection...", and

WHEREAS: The lack of adequate support of the National Bureau of Standards through the Office of Weights and Measures has made it necessary for the 66th National Conference on Weights and Measures to carry over for consideration several items which must be addressed in a timely fashion; the troubling aspect of this situation is that as each year's agenda is burdened by carryovers from the previous year, the snowballing effect may threaten the effectiveness of the Conference, and

WHEREAS: This indifference and lack of adequate support by the National Bureau of Standards to the Office of Weights and Measures has resulted in a lack of national leadership to the States and degradation of weights and measures programs; therefore,

BE IT RESOLVED: That this National Conference on Weights and Measures by resolution to the Subcommittee on Science, Research, and Technology enlist their support in mandating the Director of the National Bureau of Standards to provide technical and professional support to State Directors of Weights and Measures programs; and to continue to sponsor the National Conference on Weights and Measures.

BE IT FURTHER RESOLVED: That this Conference goes on record of supporting the testimony and recommendations which were stated on June 17-18, 1981 before the House Subcommittee on Science, Research, and Technology of Sydney D. Andrews, American Society for Testing and Materials, James R. Bird, National Conference on Weights and Measures, and Kenneth L. Hammer, Scale Manufacturers Association.

AND BE IT FURTHER RESOLVED: That this Resolution be sent to the Honorable Doug Walgren, Chairman, Subcommittee on Science, Research, and Technology and copies to members of the House Subcommittee on Science, Research, and Technology; Honorable Malcolm Baldrige, Secretary of Commerce; Dr. Ernest Ambler, Director, National Bureau of Standards; and Albert D. Tholen, Chief, Office of Weights and Measures, National Bureau of Standards.

(Item 702 was adopted)

COMMENDATION OF HAROLD F. "BUD" WOLLIN

WHEREAS: Harold F. "Bud" Wollin has given 32 years of dedicated government service, 27 of these years dedicated to the betterment of Weights

and Measures programs and officials and the last 12 years contributing much to the success of the National Conference on Weights and Measures when he served as Executive Secretary.

WHEREAS: His planning, direction, and support of many local, State, and national programs have contributed much to the success of many weights and measures officials, let alone the fact he is a "downright" good guy.

BE IT RESOLVED: That the 66th National Conference on Weights and Measures sincerely thank and commend Bud for his accomplishments and efforts in behalf of the entire weights and measures community. We wish him and his family success and happiness in his new endeavors.

(Item 703 was adopted)

704

RESOLUTION OF THE AVAILABILITY OF
NBS AND NCWM PUBLICATIONS

WHEREAS: The weights and measures officials throughout the United States and its territories rely upon publications of the National Bureau of Standards and the National Conference on Weights and Measures, and

WHEREAS: These publications consist of handbooks and published standards (including voluntary product standards), and

WHEREAS: The industries regulated by the weights and measures officials also rely upon these same publications for uniformity of information and regulation,

NOW THEREFORE BE IT RESOLVED: That the National Conference on Weights and Measures request that any publications of the National Bureau of Standards and the National Conference on Weights and Measures, such as handbooks, published standards (including voluntary product standards), etc. remain in print and available as long as they have not been superseded by a new publication or an expiration date set forth in the document has been reached.

(Item 704 was adopted)

705

RESOLUTION ON WEIGHTS AND MEASURES PROGRAMS
IN NAVAJO NATION

WHEREAS: The Navajo Nation is considering abolishing their weights and measures program.

BE IT RESOLVED: That the 66th NCWM sincerely urges Chairman Peter McDonald and the members of the Navajo Council to retain an independent and active weights and measures program, and

BE IT FURTHER RESOLVED: That this resolution be transmitted to Chairman Peter McDonald with copies to Council Members Navajo Nation.

(Item 705 was adopted)

E. STEPHENS, Utah, Chairman
P. ADAMS, Bucks County, Pennsylvania
J. ALLOWAY, Nebraska
R. CHAMPION, Texas
F. GERK, New Mexico
D. STAGG, Alabama
P. STAGG, Louisiana

Resolutions Committee

(On motion of the committee chairman, the report of the Resolutions Committee, voting key items 700 through 705, was adopted in its entirety by the Conference.)

REPORT OF THE NOMINATIONS COMMITTEE

Presented by CHARLES H. VINCENT, Chairman
Department of Consumer Affairs, Director,
City of Dallas, Texas

(July 16, 1981)

VOTING KEY

800

INTRODUCTION

The Nominations Committee met during the Conference for the purpose of selecting a slate of nominees for all elective offices and for the ten elective memberships of the Executive Committee. In the selection of nominees from the active membership, consideration was given to the professional experience and qualifications of individuals; attendance records, geographical distribution, and Conference participation; and to other factors deemed by the committee to be important.

801

NOMINATIONS

The Nominations Committee submits the following names in nomination for office to serve during the ensuing year and at the 67th National Conference on Weights and Measures:

Nominations

Chairman:

Edward C. Heffron, Michigan

Vice Chairmen:

Ezio Delfino, California

Charles E. Forester, Texas

Sam F. Valtri, Philadelphia, Pa.

Robert W. Walker, Indiana

Treasurer:

Allan M. Nelson, Connecticut

Chaplain:

Francis W. Daniels, Wayne County, Indiana

Executive Committee:

1. James W. Abbott, Missouri
2. James C. Blackwood, City of Dallas, Texas
3. George S. Franks, Cumberland County, New Jersey
4. Patricia Fullinwider, Arizona
5. Thomas E. Kirby, Georgia

6. Gunnar Magnuson, Washington
7. Bruce Niebergall, North Dakota
8. Joseph Rothleder, California
9. Robert J. Silcock, Vigo County, Indiana
10. Charles T. Smith, South Carolina

(There being no further nominations from the floor, the Chairman declared nominations closed and requested the Executive Secretary to cast a unanimous ballot for all nominees.)

C. VINCENT, Dallas, Texas, Chairman
 S. ANDREWS, Florida
 F. BRUGH, Indianapolis, Indiana
 J. LYLES, Virginia
 G. MATTIMOE, Hawaii
 K. SIMILA, Oregon
 R. THOMPSON, Maryland

Nominations Committee

(On motion of the committee chairman, the report of the Nominations Committee, voting key item 801, was adopted in its entirety by the Conference. The results of the voting in the House of Representatives and the House of Delegates under the Conference voting system are totalized in the table that follows.)

VOTING RESULTS - Nominations Committee

Voting Key	House of State Representatives		House of Delegates	
	Yes	No	Yes	No
801	43	0	60	0

REPORT OF THE AUDITING COMMITTEE

Presented by GUY J. TOMMASI, City Sealer,
Middletown, Connecticut

(Thursday, July 16, 1981)

VOTING KEY

900

INTRODUCTION

The Auditing Committee met on Wednesday morning, July 15, for the purpose of reviewing the financial records of the Conference Treasurer, Mr. Allan M. Nelson. The Committee finds these records to be in accordance with Conference procedure and correct.

G. J. TOMMASI, Middletown, Connecticut, Chairman

R. B. JONES, Salem County, New Jersey

W. P. ELDRIDGE, Mississippi

Committee on Auditing

(On motion of the committee chairman, the report of the Auditing Committee, voting key item 900, was adopted by the Conference.)



REPORT OF THE CONFERENCE TREASURER

Presented by ALLAN M. NELSON, Metrologist, Weights and
Measures Division, Department of Consumer
Protection, State of Connecticut

(Thursday, July 16, 1981)

VOTING KEY

1000

INTRODUCTION

It is my pleasure to report to you today on the financial status
of the Conference treasury as follows:

Cash on Hand, June 1, 1980	\$24,089.22
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DEPOSITORIES

Southington Bank & Trust Co. - Southington, CT.	\$24,072.98
Union Trust Co. - Gaithersburg, Maryland	<u>16.24</u>

TOTAL	<u><u>\$24,089.22</u></u>
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RECEIPTS

Registration-65th Conference - 135 @ \$75.00	\$10,125.00
" " " - 168 @ \$50.00	8,400.00
Conference Membership - 1980-1981 - 176 @ \$25.00	4,400.00
" " - 1981-1982 - 32 @ \$35.00	1,120.00
Breakfast Meals - 93 @ \$ 5.00	465.00
Refund - Ladies Mt. Vernon trip	57.00
Sale of Caps & Plaques	130.00
Sale of Color Photos - 7 @ \$10.00	70.00
Publications	603.70
Refund from James Bird	101.65
Registrations - 66th Conference - 15 @ \$50.00	750.00
Refund from Frank Nagele - OIIML Trip	1,043.54
Interest from N. O. W. Account	<u>201.02</u>

TOTAL RECEIPTS	<u><u>\$27,466.91</u></u>
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TOTAL Cash Balance - June 1, 1980 and Receipts	<u><u>\$51,556.13</u></u>
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DISBURSEMENTS

Metro Business Forms - Membership Cards & Renewal Notices	\$ 1,283.16
G. G. Tauber Co. - Badge Holders	97.13
Awards Co. of America - Plaque	26.26
Gladiator Sports & Awards, Inc. - Conference Ribbons	23.19
Willoughby & Son, Inc. - 2 Yr. Premium for Treas. Bond	96.00
Ann Heffernan - Conference Supplies	48.88
Franklin Press - Letterheads & Conference Receipts	354.80

William Pierce - 65th Conference Speaker	236.40
Louis S. Meyer - 65th Conference Speaker	273.75
Washington Boat Lines - Ladies Tour	300.00
Dawson's Charter Service-Bus for Ladies Tour	400.00
American Security Bank - Cashier's Check	3.00
Visual Aids Electronic - Microphones & Visual Aid Equip. for 65th Conference	336.00
Xerox Corporation - Monthly Charges - June thru Nov. & Paper	1,087.45
Specialty Assoc. Serv. - Computer Printouts & Mailing Labels	1,934.60
Howard Devron - Music - 65th Conference	1,055.00
Edward Stadolnick - Travel Advance for Western Conference & Washington Meeting	1,500.00
State of Nebraska - Refund on Conf. Registration	25.00
Central Photo Co. - 10 Colored Photos - 65th Conf.	100.00
Shoreham Americana Hotel - Conference Expenses	4,212.82
Edward Stadolnick - Southern Conference	329.53
U.S. Postal Service - P.O. Box Rental	22.00
Comm. on Educ., Admin. & Consumer Affairs (Travel)	2,466.49
Charles Cavagnaro - Travel Advance - Interim Meeting	400.00
Graphis, Inc. - Charter Membership Cert. & Printing	3,370.00
Columbia Books, Inc. - National Trade Volume	37.00
Interim Meeting Expenses	13,622.80
National Bureau of Standards - Handbooks 44 & 130	3,191.88
Paramount Travel - John Bartfai - San Diego	753.34
Lacy De Grange - Northeastern Weights & Measures Conference	422.00
Allan M. Nelson, Treasurer - Airfare - St. Louis	261.00
Conference Expenses - Paid from Union Trust Account by Ann Heffernan	1,864.99
Frank Nagele - OIML Trip	<u>2,087.08</u>
Total Disbursements	\$42,221.55
Cash on Hand - June 30, 1981	<u>9,334.58</u>
Total Disbursements and Cash Balance	<u>\$51,556.13</u>
DEPOSITORIES	
Southington Bank & Trust Co. - Southern, CT.	9,183.33
Union Trust Co. - Gaithersburg, Maryland	151.25
	<u>\$ 9,334.58</u>

(signed) Allan M. Nelson, Treasurer

(On motion of Mr. Nelson, the report of the Conference Treasurer, voting key item 1000, was adopted by the Conference).

REGISTRATION LIST

66TH NATIONAL CONFERENCE ON WEIGHTS AND
MEASURES

July 13-17, 1981

Stouffer's Riverfront Towers, St. Louis, Missouri

ALABAMA

STATE ----- DON E. STAGG, Director, Weights and Measures Division,
Department of Agriculture, P. O. Box 3336, Montgomery,
Alabama 36193 (Tel. (205) 832-6766)

ALASKA

STATE ----- JOSEPH L. SWANSON, Chief, Weights and Measures, State
of Alaska, P. O. Box 10-1686, Anchorage, Alaska 99511
(Tel. (907) 345-3886)

ARIZONA

STATE ----- PATRICIA M. FULLINWIDER, Chief, Weights and Measures
Division, State of Arizona, DoA, 3039 West Indian
School, Phoenix, Arizona 85017 (Tel. (602) 255-5211)

ARKANSAS

STATE ----- SAM F. HINDSMAN, Director, Arkansas Weights and Mea-
sures, 4608 West 61st Street, Little Rock, Arkansas
72209 (Tel. (501) 371-1759)

CALIFORNIA

STATE ----- EZIO F. DELFINO, Assistant Director, Division of
Measurement Standards, State of California, 8500
Fruitridge Road, Sacramento, California 95826
(Tel. (916) 366-5119)

DARRELL GUENSLER, Assistant Chief, Division of Measure-
ment Standards, State of California, 8500 Fruitridge
Road, Sacramento, California 95826 (Tel. (916)
366-5119)

JOSEPH ROTHLEDER, Metrologist, Division of Measurement
Standards, 8500 Fruitridge Road, Sacramento, Cali-
fornia 95826 (Tel. (916) 366-5119)

COUNTY

Alameda ----- PATRICK E. NICHOLS, Director of Weights and Measures,
Alameda County, 333 - 5th Street, Oakland, Cali-
fornia 94607 (Tel. (415) 874-6736)

Fresno ----- ROBERT B. Voss, Director, Weights and Measures, 4535 E. Hamilton, Fresno, California 93702 (Tel. (209) 453-5904)

Glenn ----- ED ROMANO, Sealer, Department of Weights and Measures, P. O. Box 351, Willows, California 95988 (Tel. (916) 934-4651)

Los Angeles ----- W. R. MOSSBERG, Director, Los Angeles County Department of Weights and Measures, 11012 Garfield Avenue, South Gate, California 90280 (Tel. (213) 922-8921)

Santa Clara ----- DANIEL R. SMITH, Director of Consumer Affairs, County of Santa Clara, 1555 Berger Drive, San Jose, California 95112 (Tel. (408) 299-4700)

Santa Cruz ----- JOHN SIMMEN, Director, Weights and Measures, 1430 Freedom Boulevard, Watsonville, California 95076 (Tel. (408) 724-1149)

Yuba ----- JACK A. HUEY, Director of Weights and Measures, Yuba County, 921 West 14th Street, Marysville, California 95901 (Tel. (916) 674-6377)

COLORADO

STATE ----- LEO LETEY, Chief, Weights and Measures Section, Department of Agriculture, 3125 Wyandot, Denver, Colorado 80003 (Tel. (303) 839-2845)

CONNECTICUT

STATE ----- JOHN T. BENNETT, Chief, Weights and Measures, State of Connecticut, Department of Consumer Protection, State Office Building, Room G-17, Hartford, Connecticut 06115 (Tel. (203) 566-4778 or 566-5230)

ALLAN M. NELSON, Metrologist, Department of Consumer Protection, Weights and Measures Division, State Office Building, Room G-17, 165 Capitol Avenue, Hartford, Connecticut 06115 (Tel. (203) 566-5230)

WILLIAM J. SLAMON, JR., Senior Inspector, Department of Consumer Protection, Weights and Measures Division, 165 Capitol Avenue, Hartford, Connecticut 06115 (Tel. (203) 566-5230)

CITY ----- GUY J. TOMMASI, Sealer of Weights and Measures, City of Middletown, City Hall, Middletown, Connecticut 06457 (Tel. (203) 347-4671 Ext. 215)

DELAWARE

STATE ----- EUGENE KEELEY, Supervisor, Delaware Weights and Measures, Drawer D, Dover, Delaware 19901 (Tel. (302) 736-4824)

FLORIDA

STATE ----- SYDNEY D. ANDREWS, Director, Division of Standards, Florida Department of Agriculture & C. S. Mayo Building-Lab Complex, Tallahassee, Florida 32301 (Tel. (904) 488-0645)

WILLIAM A. COGBURN, JR., Metrologist Supervisor,
Florida Department of Agriculture, Bureau of Weights
and Measures, Mayo Building, Tallahassee, Florida 32304
(Tel. (904) 488-9295)

STAN DARSEY, Chief, Bureau of Weights and Measures,
Florida Department of Agriculture and Consumer Ser-
vices, Mayo Building, Tallahassee, Florida 32301
(Tel. (904) 488-9140)

COUNTY

Dade -----

JOHN C. MAYS, Director, Dade County Consumer
Protection, 140 West Flagler Street, Room 1604,
Miami, Florida 33130 (Tel. (305) 579-4222)

ARTHUR HERSHBEIN, Deputy Director, Metro Dade County
Consumer Protection Division, 140 West Flagler
Street, Room 1604, Miami, Florida 33130
(Tel. (305) 579-4222)

GEORGIA

STATE -----

MARTIN T. COILE, Assistant Director, Weights and
Measures, Georgia Department of Agriculture, Atlanta
Farmers Market, Forest Park, Georgia 30050 (Tel.
(404) 363-7611)

THOMAS E. KIRBY, Director, Weights and Measures
Laboratory, Georgia Department of Agriculture,
Atlanta Farmers Market, Forest Park, Georgia 30050
(Tel. (404) 363-7611)

GUAM

FRANK C. BENAVENTE, Compliance Officer, Weights and
Measures Inspector, Department of Revenue and
Taxation, P. O. Box 2796, Agana, Guam 96910 (Tel.
(671) 472-6197)

HAWAII

STATE -----

GEORGE E. MATTIMOE, Deputy Director, Measurement
Standards, State of Hawaii, 1428 South King Street,
P. O. Box 22159, Honolulu, Hawaii 96822 (Tel. (808)
548-7152)

LELAND K. TOM, Inspector, Division of Weights and
Measures, Hawaii, 1428 S. King Street, Honolulu,
Hawaii 96814 (Tel. (808) 548-7151)

IDAHO

STATE -----

LYMAN D. HOLLOWAY, Chief, Department of Agriculture,
Weights and Measures, 2216 Kellogg Lane, Boise,
Idaho 83702 (Tel. (208) 334-2345)

ILLINOIS

STATE -----

WAYNE W. BEHRNS, Bureau Chief, Illinois Department of
Agriculture, Emmerson Building, State Fairgrounds,
Springfield, Illinois 62706 (Tel. (217) 782-3817)

SIDNEY A. COLBROOK, Weights and Measures Program
Supervisor, Illinois Department of Agriculture,
Emmerson Building, State Fairgrounds, Springfield,
Illinois 62706 (Tel. (217) 782-3817)

WALTER A. HOLSTROM, Supervisor, Illinois Department of
Agriculture, 1010 Jorie Boulevard, Room 20, Oak Brook,
Illinois 60521 (Tel. (312) 920-9256)

STEPHEN E. MCGUIRE, Metrologist, Illinois Department of
Agriculture, Emmerson Building, State Fairgrounds,
Springfield, Illinois 62706 (Tel. (217) 782-7655)

RUSSELL OGG, Supervisor, Illinois Department of
Agriculture, 2209 W. Main Street, Marion, Illinois
62959 (Tel. (618) 997-4371 Ext. 390)

RICH PHILMON, Lab Technician, Illinois Department of
Agriculture, Emmerson Building, State Fairgrounds,
Springfield, Illinois 62706 (Tel. (217) 782-7655)

BOB SCHWARBERG, Bureau Chief, Illinois Department of
Agriculture, Emmerson Building, State Fairgrounds,
Springfield, Illinois 62706 (Tel. (217) 782-7655)

CITY

Harvey -----

NORMAN K. KUTSCHER, City Sealer and Health Inspector,
City of Harvey Public Affairs, 15320 Broadway, P. O.
Box 617, Harvey, Illinois 60426 (Tel. (312) 339-4200
Ext. 32)

INDIANA

STATE -----

ROBERT W. WALKER, Director, Division of Weights and
Measures, State of Indiana, 1330 West Michigan
Street, Indianapolis, Indiana 46206 (Tel. (317)
633-0350)

COUNTY

Clark -----

HAROLD D. BRADSHAW, Inspector, Weights and Measures,
Clark County, City-County Building, Room 314,
Jeffersonville, Indiana 47130 (Tel. (812) 283-4451)

Floyd -----

JAMES M. MOREILLON, Inspector, Weights and Measures,
Floyd County, 627 East Fourth Street, New Albany,
Indiana 47150 (Tel. (812) 944-0470)

Gibson -----

WILLIAM R. SEVIER, Weights and Measures Inspector,
Box 302, Somerville, Indiana 47683 (Tel. (812)
795-2532)

Johnson -----

WAYNE E. HANDY, Inspector, Weights and Measures,
Johnson County Courthouse, Franklin, Indiana 46131
(Tel. (317) 736-5774)

Lake -----

ALBERT M. MYSOGLAND, Lake County Sealer, Department
of Weights and Measures, 2293 North Main Street,
Crown Point, Indiana 46307 (Tel. (219) 663-2896)

Laporte -----

EDWIN HANISH, Inspector, Indiana State Board of Health,
119 Tilden Avenue, Michigan City, Indiana 46360
(Tel. (219) 879-9486)

KANSAS

STATE ----- JOHN L. O'NEILL, State Sealer and Director, State Board of Agriculture, Weights and Measures Division, 901 Kansas Avenue, Topeka, Kansas 66612 (Tel. (913) 296-3846)

JAMES R. EVANS, Inspector, Weights and Measures, 215 E. 7th Street, Topeka, Kansas 66605 (Tel. (913) 295-3883)

DONALD L. LYNCH, Director, Weights and Measures Control, 710 N. 7th Street, Kansas City, Kansas 66101 (Tel. (913) 371-2000 Ext. 440)

KENTUCKY

STATE ----- VICTOR PAGE, Supervisor, Division of Weights and Measures, Department of Agriculture, 106 West 2nd Street, Frankfort, Kentucky 40601 (Tel. (502) 564-4870)

MARK L. WHITAKER, Metrologist, Division of Weights and Measures, Department of Agriculture, 106 West 2nd Street, Frankfort, Kentucky 40601 (Tel. (502) 564-4870)

LOUISIANA

STATE ----- PHILIP A. STAGG, Director, Louisiana Weights and Measures, Department of Agriculture, P. O. Box 44456, Capitol Station, Baton Rouge, Louisiana 70804 (Tel. (504) 925-3780)

MAINE

STATE ----- GAYLON M. KENNEDY, Deputy State Sealer of Weights and Measures, Maine Department of Agriculture, State House, Station #28, Augusta, Maine 04333 (Tel. (207) 289-3841)

MARSHALL WHITE, Metrologist, Maine Department of Agriculture, State House, Augusta, Maine 04333 (Tel. (207) 289-3841)

MARYLAND

STATE ----- LACY H. DEGRANGE, Assistant Chief, Weights and Measures, Maryland Department of Agriculture, 3205 Symons Hall, University of Maryland, College Park, Maryland 20742 (Tel. (301) 454-3551)

RICHARD L. THOMPSON, Chief of Weights and Measures, Maryland Department of Agriculture, 3205 Symons Hall, University of Maryland, College Park, Maryland 20742 (Tel. (301) 454-3551)

Madison -----	CHARLES W. MOORE, County Inspector, Weights and Measures of Indiana, Madison County Government Center and Courts, Anderson, Indiana 46051 (Tel. (317) 646-9359)
Porter -----	RICHARD H. CLAUSSEN, Inspector, Porter County, 1401 North Calumet, Room 105, Valparaiso, Indiana, 46383 (Tel. (219) 766-2323)
St. Joseph -----	CHESTER S. ZMUDZINSKI, Inspector, Weights and Measures, St. Joseph County, 227 West Jefferson Boulevard, South Bend, Indiana 46601 (Tel. (219) 284-9751)
Tiptecanoe -----	JAMES A. VANDERWIELEN, Inspector, Tiptecanoe County Weights and Measures, Lafayette, Indiana 47901 (Tel. (317) 423-9229)
Vigo -----	ROBERT J. SILCOCK, Inspector, Vigo County Weights and Measures, Room 5, Court House, Terre Haute, Indiana 47807 (Tel. (812) 238-8349)
Wayne -----	FRANCIS W. DANIELS, Administrator, Wayne County Weights and Measures, 50 North 5th, Richmond, Indiana 47374 (Tel. (317) 935-4813)
 CITY	
Anderson -----	EARL GADBERRY, Inspector of City Anderson, Department of Weights and Measures, P. O. Box 2100, 120 E. 8th Street, Anderson, Indiana 46011 (Tel. (317) 646-5814)
Indianapolis -----	FRANK L. BRUGH, Administrator, Division of Weights and Measures of Indianapolis, 204 E. Washington St., Indianapolis, Indiana 46204 (Tel. (317) 633-3733)
Hammond -----	DEAN BRAHOS, City Sealer, Weights and Measures Department, 741 Michigan Street, Room 104, Hammond, Indiana 46320 (Tel. (219) 853-6377)
Mishawaka -----	GEORGE STAFFELDT, City Sealer, Weights and Measures, City Hall, Mishawaka, Indiana 46544 (Tel. (219) 255-2281)
New Albany -----	JAMES M. MOREILLON, Inspector, Weights and Measures, Floyd County, 627 East Fourth Street, New Albany, Indiana 47150 (Tel. (812) 944-0470)
South Bend -----	JOSEPH NAGY, Sealer of Weights and Measures, City of South Bend, Indiana, 701 W. Sample Street, South Bend, Indiana 46621 (Tel. (219) 284-9273)

IOWA

STATE -----	JIM M. O'CONNOR, Supervisor, Standards Control, Weights and Measures Division, Iowa Department of Agriculture, Wallace Building, Des Moines, Iowa 50319 (Tel. (515) 281-5716)
	ROBERT E. HOLLIS, Metrologist, Iowa Department of Agriculture, Henry A. Wallace Building, Des Moines, Iowa 50319 (Tel. (515) 281-5716)

MASSACHUSETTS

STATE ----- EDWARD H. STADOLNIK, Assistant Director of Standards,
Commonwealth of Massachusetts, Division of Stan-
dards, Room 1115, One Ashburton Place, Boston,
Massachusetts 02108 (Tel. (617) 727-3480)

CITY

Agawam ----- LOUIS D. DRAGHETTI, Inspector, Weights and Measures,
Town of Agawam, 36 Main Street, Town Administration
Building, Agawam, Massachusetts 01001 (Tel. (413)
786-0400 Ext. 232)

Barnstable ----- THOMAS F. GEILER, Sealer of Weights and Measures,
Town of Barnstable, 397 Main Street, Hyannis,
Massachusetts 02601 (Tel. (617) 775-1120)

MICHIGAN

STATE ----- EDWARD C. HEFFRON, Chief, Food and Dairy Division,
Michigan Department of Agriculture, P. O. Box
30017, Lewis Cass Building, Lansing, Michigan
48909 (Tel. (517) 373-1060)

RODNEY JORDAN, Regional Supervisor, Michigan Department
of Agriculture, Weights and Measures, Box 156,
Bridgeport, Michigan 48722 (Tel. (517) 777-5939)

LARRY KREAMER, Inspector, Michigan Weights and Measures
Lewis Cass Building, 5th Floor, Lansing, Michigan
48909 (Tel. (313) 673-0514)

FRANK C. NAGELE, Weights and Measures Specialist,
Michigan Department of Agriculture, P. O. Box
30017, Lewis Cass Building, Lansing, Michigan
48909 (Tel. (517) 373-1060)

MINNESOTA

STATE ----- JOHN A. BERGQUIST, Director, Licenses and Consumer
Service, City Hall, Room 101A, Minneapolis,
Minnesota, 55415 (Tel. (612) 348-2080)

EDWARD P. SKLUZACEK, Director, Minnesota Weights and
Measures, 1015 Currie Avenue, Minneapolis, Minnesota
55403 (Tel. (612) 341-7200)

MISSISSIPPI

STATE ----- JAMES H. SPENCER, Director, Mississippi Department of
Agriculture and Commerce, P. O. Box 1609, Jackson,
Mississippi 39205 (Tel. (601) 354-6258)

WILLIAM P. ELDRIDGE, Supervisor of Intermediate Scales,
Mississippi Department of Agriculture and Commerce,
P. O. Box 1609, Jackson, Mississippi 39205 (Tel.
(601) 354-6258)

MISSOURI

STATE ----- J. W. ABBOTT, Director, Division of Weights and Measures, P. O. Box 630, Jefferson City, Missouri 65102 (Tel. (314) 751-4278)

JACK C. PIERCE, Laboratory Program Supervisor, Missouri Department of Agriculture, P. O. Box 630, Jefferson City, Missouri 65102 (Tel. (314) 751-3440)

CITY

St. Louis ----- MERLE J. ANKER, Supervisor, Office of Weights and Measures, 7900 Forsyth Boulevard, Clayton, Missouri 63105 (Tel. (314) 889-2079)

RAYMOND AMANN, Consumer Standards Inspector, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3251)

JEPHTHA BOXX, Consumer Standards Inspector, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3251)

HOWARD P. CALHOUN, Consumer Standards Inspector, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3251)

CHERYLLE A. HUGHES, Weights and Measures Official, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3251)

DANIEL I. OFFNER, Commissioner of Weights and Measures, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3252)

ROBERT A. PINKNEY, Consumer Standards Supervisor, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri 63104 (Tel. (314) 622-3251)

ROBERT THIER, Consumer Standards Inspector, City of St. Louis, 1220 Carr Lane Avenue, Room 145, St. Louis, Missouri, 63104 (Tel. (314) 622-3251)

NEBRASKA

STATE ----- JOHN W. ALLOWAY, Assistant Director, Department of Agriculture, Division of Weights and Measures, 301 Centennial Mall South, Box 94757, Lincoln, Nebraska 68509 (Tel. (402) 471-2341, Ext. 208)

RICHARD C. SUITER, Metrologist, State of Nebraska Division of Weights and Measures, Box 94757, Lincoln, Nebraska 68509 (Tel. (402) 471-2341 Ext. 284)

CITY

Omaha ----- NORMAN M. ROSS, Chief, Weights and Measures Division, Public Safety, Department of Weights and Measures, Douglas Civic Center, 1819 Farham, Omaha, Nebraska 68183 (Tel. (402) 444-5368)

NEW JERSEY

STATE ----- JAMES R. BIRD, Deputy State Superintendent, New Jersey
Weights and Measures, 187 West Hanover Street,
Trenton, New Jersey 08625 (Tel. (609) 292-4615)

S. H. CHRISTIE, JR., Retired State Superintendent,
123 Hillcrest Road, Arren, New Jersey 07060
(Tel. (201) 647-3267)

COUNTY

Cumberland ----- GEORGE S. FRANKS, Superintendent, Weights and Measures
and Consumer Protection, Cumberland County, 788
East Commerce Street, Bridgeton, New Jersey 08302
(Tel. (609) 451-8000 Ext. 369 and 370)

Gloucester ----- JOSEPH SILVESTRO, Superintendent, Gloucester County
Weights and Measures, 49 Wood Street, County Build-
ing, Woodbury, New Jersey 08096
(Tel. (609) 845-1600 Ext. 252)

Middlesex ----- JOHN M. CHOHAMIN, Superintendent, Middlesex County
Department of Weights and Measures, 841 Georges
Road, North Brunswick, New Jersey 08902
(Tel. (201) 745-3878)

Monmouth ----- WILLIAM G. DOX, Superintendent, Monmouth County
Department of Weights and Measures, Hall of Records
Annex, Main Street, Freehold, New Jersey 07728
(Tel. (201) 431-7363)

Salem ----- ROBERT B. JONES, Superintendent of Weights and Mea-
sures, Salem County Department of Weights and
Measures, 94 Market Street, Box 24, Salem, New
Jersey 08079 (Tel. (609) 935-7510 Ext. 369)

CITY

Linden ----- ALEXANDER ESKA, Superintendent, City of Linden Weights
and Measures, 1408 Summit Terrace, Linden,
New Jersey 07036 (Tel. (201) 486-8429)

NEW MEXICO

STATE ----- FRED A. GERK, Associate Chief, Weights and Measures,
New Mexico Department of Agriculture, P. O. Box
3170, Las Cruces, New Mexico 88003 (Tel. (505)
646-1616)

CHARLES H. GREENE, Chief, Administrative Services,
New Mexico Department of Agriculture, P. O. Box
3189, Las Cruces, New Mexico 88003 (Tel. (505)
646-3007)

NEW YORK

STATE ----- ROSS ANDERSEN, Metrologist, New York State Bureau of
Weights and Measures, Building 7-A, State Campus,
Albany, New York 12235 (Tel. (518) 457-3449)

JOHN J. BARTFAI, Director, New York State Bureau of
Weights and Measures, Building 7-A, State Campus,
Albany, New York 12235 (Tel. (518) 457-3452)

KENNETH R. GRIDLEY, Weights and Measures Specialist
III, New York State Bureau of Weights and Measures,
1220 Washington Avenue, Albany, New York 12235
(Tel. (518) 457-3452)

COUNTY

Monroe ----- LOUIS P. ROMANO, Director, Monroe County Weights and
Measures, 1157 Scottsville Road, Rochester, New
York 14624 (Tel. (716) 436-1330)

Steuben ----- DUANE G. WRAIGHT, Director, Department of Weights and
Measures, 40 E. Steuben Street, Bath, New York 14810
(Tel. (607) 776-4949)

NORTH CAROLINA

STATE ----- THOMAS W. SCOTT, Chief, Measurement Section, North
Carolina Department of Agriculture, Consumer
Standards, P. O. Box 26056, Raleigh, North Carolina
27611 (Tel. (919) 733-3313)

L. F. EASON, Metrologist, Consumer Standards Division
P. O. Box 26056, North Carolina Department of
Agriculture, Raleigh, North Carolina 27611
(Tel. (919) 733-3246)

N. DAVID SMITH, Director, Consumer Standards Division,
North Carolina Department of Agriculture, P. O. Box
26056, Raleigh, North Carolina 27611 (Tel. (919)
733-3313)

NORTH DAKOTA

STATE ----- BRUCE NIEBERGALL, Director, Weights and Measures,
Public Service Commission, State Capitol, Bismarck,
North Dakota 58505 (Tel. (701) 224-2400)

OHIO

STATE ----- KENNETH R. ADCOCK, Chief, Division of Weights and
Measures, Ohio Department of Agriculture, ODA
Laboratories - Building #5, 8995 East Main,
Reynoldsburg, Ohio 43068 (Tel. (614) 866-6361)

JAMES C. TRUEX, Metrologist, Division of Weights and
Measures, Ohio Department of Agriculture, ODA
Laboratories - Building #5, 8995 East Main,
Reynoldsburg, Ohio 43068 (Tel. (614) 866-6361)

COUNTY

Auglaize ----- ROBERT E. KING, Inspector Weights and Measures of
Auglaize County, 209 E. Pearl Street, Wapakoneta,
Ohio 45895 (Tel. (419) 738-2415)

Clark ----- ROY K. PECK, Inspector, Weights and Measures, Clark
County Auditors Office, A. B. Graham Building,
P. O. Box 1325, Springfield, Ohio 45501 (Tel. (513)
328-2424)

Cuyahoga ----- FRANK A. KOSITS, Retired Inspector Cuyahoga County,
17500 Daleview, Lakewood, Ohio 44107 (Tel. (216)
228-8839)

Summit ----- THOMAS O. DECHECO, Inspector, Summit Count Auditor,
522 E. Cuyhoga Falls Avenue, Akron, Ohio 44310
(Tel. (216) 379-5409)

CITY

Columbus ----- FRED P. CLEM, Consumer Services Investigator, Office
of Consumer Services, 60 E. Main Street, Columbus,
Ohio 43215 (Tel. (614) 222-7397)

Dayton ----- LEON MILLER, City Sealer, City of Dayton, Ohio,
960 Ottawa Street, Dayton, Ohio 45402 (Tel. (513)
225-5304)

OKLAHOMA

STATE ----- H. H. LATHAM, Supervisor Regulatory Section, Oklahoma
Department of Agriculture, Capitol Building, Room 122,
Oklahoma City, Oklahoma 73105 (Tel. (405) 751-0847)

OREGON

STATE ----- KENDRICK J. SIMILA, Administrator, State of Oregon
Weights and Measures Division, Department of
Agriculture, Agriculture Building, Salem, Oregon
97310 (Tel. (503) 378-3792)

PENNSYLVANIA

STATE ----- FRED A. THOMAS, Director, Pennsylvania Bureau of
Weights and Measures, 2301 North Cameron Street,
Harrisburg, Pennsylvania 17110 (Tel. (717)
787-6772)

COUNTY

Bucks ----- PEGGY H. ADAMS, Chief Sealer, Weights and Measures,
Department of Bucks County Consumer Protection,
Courthouse Annex, Broad and Union Streets,
Doylestown, Pennsylvania 18901 (Tel. (215) 348-7442)

CITY

Allentown ----- ARNOLD L. HEILMAN, JR., (Retired) Sealer of Weights and
Measures, City of Allentown, 2324 South 3rd Street,
Allentown, Pennsylvania 18102 (Tel. (215) 797-1953)

Philadelphia ----- SAM F. VALTRI, Chief, Philadelphia Bureau of Weights
and Measures, Room 636, 801 Arch Street, Philadel-
phia, Pennsylvania 19107 (Tel. (215) 686-3475)

SOUTH CAROLINA

STATE ----- JOHN V. PUGH, Director Metrology Laboratory, South
Carolina Department of Agriculture, P. O. Box 11280,
Columbia, South Carolina 29211 (Tel. (803) 758-2130)

SOUTH DAKOTA

STATE ----- ALLEN L. CHRISTIE, Administrative Assistant, Department
of Commerce, Division of Commercial Inspection,
Pierre, South Dakota 57501 (Tel. (605) 773-3177)

TENNESSEE

STATE ----- JOHN C. SHELTON, Supervisor of Weights and Measures,
Box 40627, Melrose Station, Nashville, Tennessee
37204 (Tel. (615) 741-1539)

BOB WILLIAMS, Metrologist, Tennessee Department of
Agriculture, Weights and Measures, Box 40627,
Melrose Station, Nashville, Tennessee 37220 (Tel.
(615) 741-1539)

TEXAS

STATE

CITY

Austin ----- HERB ESKEW, Chief Metrologist, Texas Department of
Agriculture, 119 Camberland Road, Austin, Texas
78704 (Tel. (512) 475-3720)

CHARLES E. FORESTER, Supervisor, Weights and Measures,
Texas Department of Agriculture, Box 12847, Austin,
Texas 78711 (Tel. (512) 475-6577)

Dallas ----- JAMES C. BLACKWOOD, Assistant Director, Department of
Consumer Affairs, 1500 West Mockingbird, Room A-19,
Dallas, Texas 75235 (Tel. (214) 670-6414)

HURSTON E. PRESCOTT, Supervisor Weights and Measures,
City of Dallas, 1500 W. Mockingbird, Dallas, Texas
75235 (Tel. (214) 670-6414)

CHARLES H. VINCENT, Director, City of Dallas Department
of Consumer Affairs, Room 1f-North, City Hall, 1500
Marilla, Dallas, Texas 75201 (Tel. (214) 670-4433)

Fort Worth ----- DAVID WATSON, Consumer Products Supervisor, City of
Fort Worth, Texas, 1800 University, Room 208,
Fort Worth, Texas 76107 (Tel. (817) 870-7572)

UTAH

STATE ----- EDISON J. STEPHENS, Supervisor, Weights and Measures,
Department of Agriculture, 5757 South, 320 West
Murray, Utah 84107 (Tel. (801) 533-5459)

VERMONT

STATE ----- TRAFFORD F. BRINK, Director of Weights and Measures
and Retail Inspection, Vermont Department of
Agriculture, 116 State Street, Montpelier, Vermont
05602 (Tel. (802) 828-2436)

DOUGLAS JONES, Metrologist, Division of Weights and
Measures, Vermont Department of Agriculture,
116 State Street, Montpelier, Vermont 05602
(Tel. (802) 828-2436)

VIRGINIA

STATE ----- MARION W. CAIN, Metrologist, Virginia Weights and
Measures Section, 1 North 14th Street, Room 032,
Richmond, Virginia 23219 (Tel. (804) 786-2476)

JAMES F. LYLES, Supervisor, Virginia Weights and Measures, 1 North 14th Street, Room 032, Richmond, Virginia 23219 (Tel. (804) 786-2476)

CITY

Richmond ----- WILLIAM ALVIS, Inspector, City of Richmond Weights and Measures, 501 North Ninth Street, Richmond, Virginia 23219 (Tel. (804) 780-4208)

ANDREW B. MOODY, JR., Senior Inspector Weights and Measures, Bureau of Weights and Measures, City of Richmond, 501 North Ninth Street, Room 128, Richmond, Virginia 23219 (Tel. (804) 780-4208)

VIRGIN ISLANDS

ANGEL L. LEBRON, Assistant Director, Consumer Services Division, Golden Rock Shopping Center, Christiansted, Saint Croix, Virgin Islands 00820 (Tel. (809) 774-3130)

WASHINGTON

STATE ----- GUNNAR N. MAGNUSON, Chief, Section of Weights and Measures, Department of Agriculture, 406 General Administration Building, Olympia, Washington 98540 (Tel. (206) 753-5059)

CITY

Seattle ----- WILLIAM C. SULLIVAN, Supervisor, Weights and Measures, 805 South Dearborn Street, Seattle, Washington 98104 (Tel. (206) 625-5000)

WEST VIRGINIA

STATE ----- LAWRENCE BARKER, Commissioner, West Virginia Department of Labor, 1900 Washington Street East, Charleston, West Virginia 25305 (Tel. (304) 348-7890)

KENNETH S. BUTCHER, Inspector, West Virginia Weights and Measures, 1900 Washington Street East, Charleston, West Virginia 25305 (Tel. (304) 348-7890)

WISCONSIN

STATE ----- JAMES H. AKEY, Inspector, Weights and Measures, 718 Jackson Street, Wausau, Wisconsin 54401 (Tel. (715) 842-3789)

ROBERT PROBST, Director, Bureau of Weights and Measures, Wisconsin Department of Agriculture, Trade and Consumer Protection, 801 West Badger Road, Box 8911, Madison, Wisconsin 53708 (Tel. (608) 266-7241)

CITY

Milwaukee ----- RICHARD ROWLEY, Deputy City Sealer, Bureau of Consumer Protection, 841 North Broadway, Room 105, Municipal Building, Milwaukee, Wisconsin 53202 (Tel. (414) 278-3674)

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(303) 277-2290)

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46225 (Tel. (317) 266-2824)

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RICHARD L. DAVIS, Administrator, Regulatory Affairs, Neenah Technical Center, 1915
Marathon Avenue, Neenah, Wisconsin 54956 (Tel. (414) 729-8174)

AMERICAN CAN COMPANY

WILLIAM H. MARKS, Senior Quality Associate, Neenah Technical Center, 1915 Marathon
Avenue, Neenah, Wisconsin 54956 (Tel. (414) 729-8106)

AMERICAN NATIONAL METRIC COUNCIL

ROBERT J. PETERSEN, Program Manager, 5410 Grosvenor Lane, Bethesda, Maryland 20014
(Tel. (301) 530-8333)

AMERICAN PAPER INSTITUTE

ROGER B. BOGNAR, Manager, Tissue Division, 260 Madison Avenue, New York, New York
10016 (Tel. (212) 340-0618)

AMERICAN PETROLEUM INSTITUTE

GARY HIRSCHL, Marketing Associate, 2101 L Street, N. W., Washington, D. C. 20037
(Tel. (202) 457-6370)

AMERICAN PETROLEUM INSTITUTE

RICHARD SOUTHERS, Manager, Operations and Engineering, 2101 L Street, N. W., Washington,
D. C. 20037 (Tel. (202) 457-7014)

AMERICAN SOCIETY FOR TESTING AND MATERIALS

EARL R. SULLIVAN, Deputy Director, American Society for Testing and Materials, 1916
Race Street, Philadelphia, Pennsylvania 19103 (Tel. (215) 299-5514)

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GUY W. WILSON, Manager, Corporate Marketing Development, Audubon Road, Wakefield,
Massachusetts 01880 (Tel. (617) 777-4500)

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FLOYD TAMELINGSON, Vice President, P. O. Box 501, Fort Wayne, Indiana 46801
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Missouri 63118 (Tel. (314) 577-3966)

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(214) 242-0525)

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37205 (Tel. (615) 352-3710)

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NICHOLAS D. BABIC, Metric Coordinator, 515 South Flower Street, AP 23117, Los Angeles,
California 90071 (Tel. (213) 486-2941)

ATLANTIC RICHFIELD COMPANY

RICHARD J. CUNNINGHAM, Engineering, Construction and Maintenance, P. O. Box 2679,
Los Angeles, California 90071 (Tel. (213) 486-2283)

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ROBERT L. FONGER, Senior Technician, P. O. Box 597, Muskegon, Michigan 49443
(Tel. (616) 733-1302)

BENNETT PUMP COMPANY

MITCHELL S. GODSMAN, District Manager, 1501 Santa Rosa Road, #B14, Richmond,
Virginia 23228 (Tel. (804) 282-6965)

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MEL MAXSON, Chief Product Engineer, 4102 N. 325 W., LaPorte, Indiana 46350
(Tel. (219) 326-7000)

BLH ELECTRONICS

MARTIN SPOOR, Vice President Engineering, 42 Fourth Avenue, Waltham, Massachusetts 02254 (Tel. (617) 890-6700)

BROOKS INSTRUMENT DIVISION

BARRIE L. BLOSER, Chief Engineer, Highway 301 North, Statesboro, Georgia 30458 (Tel. (912) 764-5471)

CALIFORNIA ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

EARL R. KALAR, President, P. O. Box 637, San Luis Obispo, California 93406 (Tel. (805) 549-5910)

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W. TERRY JAMES, Vice President, Engineering, 203 East Daugherty, Webb City, Missouri 64870 (Tel. (417) 673-4631)

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WILLIAM H. PERRY, President, 203 East Daugherty, Webb City, Missouri 64870 (Tel. (417) 673-4631)

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NEIL M. MCHUGH, Director of Quality Improvement and Assurance, 300 Park Avenue, New York, New York 10022 (Tel. (212) 310-2611)

COLGATE PALMOLIVE COMPANY

EDWARD E. WOLSKI, Consultant 405 Glendale Road, Wyckoff, New Jersey 07481 (Tel. (201) 652-0284)

CONRAIL

C. THOMAS PICTON, System Supervisor Scale Inspection, 6 Penn Center, Philadelphia, Pennsylvania 19104 (Tel. (215) 977-1622)

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JERRY COTTER, Operations Manager, 5100 Oakland Avenue, St. Louis, Missouri 63110 (Tel. (314) 531-8300)

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ALBERT LIVESAY, Vice President, P. O. Box 505, Oakland, Illinois 61943 (Tel. (217) 346-3114)

CORN BELT FABRICATORS, INC.

JIM LIVESAY, P. O. Box 505, Oakland, Illinois 61943 (Tel. (217) 346-3114)

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DAVID B. FUNK, Senior Design Engineer, Box 10, Auburn, Illinois 62615 (Tel. (217) 438-3371)

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WARREN E. BOHON, President, P. O. Box 1899, Lynnwood, Washington 98036 (Tel. (206) 771-3619)

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WARREN J. DUBSKY, Project Engineer, 124 West College Avenue, Salisbury, Maryland 21801 (Tel. (301) 546-6688)

DUNBAR MANUFACTURING, INC.

HARVEY M. LODGE, President, 307 Broadway, Swanton, Ohio 43558 (Tel. (419) 244-3021)

EXXON COMPANY U. S. A.

HAROLD E. HARRIS, Senior Advisor, P. O. Box 2180, Houston, Texas 77001 (Tel. (713) 656-6170)

EXXON CORPORATION

RAYMOND A. HARTMANN, Advisor, 1251 Avenue of the Americas, New York, New York 10020 (Tel. (212) 398-5179)

FAIRBANKS WEIGHING DIVISION OF COLT INDUSTRIES

ROBERT E. CALLIHAN, Vice President of Engineering, Colt Industries, 711 East St. Johnsbury Road, St. Johnsbury, Vermont 05819 (Tel. (802) 748-5111)

FAIRBANKS WEIGHING DIVISION OF COLT INDUSTRIES

KENNETH F. HAMMER, President, Colt Industries, 711 East St. Johnsbury Road,
St. Johnsbury, Vermont 05819 (Tel. (802) 748-5111)

FAIRBANKS WEIGHING DIVISION OF COLT INDUSTRIES

DICK HURLEY, Manager, Engineering Services, 711 East St. Johnsbury Road, St. Johnsbury,
Vermont 05819 (Tel. (802) 748-5111)

FOREMOST MCKESSON, INC.

ALFRED E. JOHANSON, Senior Counsel, 180 Baldwin Avenue, Jersey City, New Jersey 07306
(Tel. (201) 653-3800 Ext. 269)

GENERAL ATOMIC COMPANY

TIMOTHY PETITT, Projects Manager, 10955 John Jay Hopkins Drive, San Diego, California
92138 (Tel. (714) 455-3030)

GENERAL MILLS, INC.

ROBERT L. NELSON, Manager Weights and Measures, 9000 Plymouth Avenue N., Minneapolis,
Minnesota 55427 (Tel. (612) 540-2729)

GENERAL MILLS, INC.

NEAL D. PETERSON, Attorney, 1730 M Street, N. W., Washington, D. C. 20036 (Tel. (202)
296-0360.

GENERAL MILLS, INC.

LAWRENCE SAWYER, Deputy Director, General Mills, Inc., 1200 New Hampshire Avenue, N.W.,
Suite 370, Washington, D.C. 20036 (Tel. (202) 463-6590)

GERBER PRODUCTS COMPANY

RAY E. VANHUSS, JR., Assistant Director, Government Relations, 445 State Street,
Fremont, Michigan 49412 (Tel. (616) 928-2267)

GILBARCO, INC.

JOHN S. GROSE, Authorities and Standards Group Leader, 7300 West Friendly Avenue,
Greensboro, North Carolina 27420 (Tel. (919) 292-3011)

GILBARCO, INC.

CLAUDE PARENT, Director National Accounts, 1020 Aileen Street, Lafayette, California
94549 (Tel. (415) 284-1813)

GROCERY MANUFACTURERS OF AMERICA

ANDREW B. MOORE, Science Associate, 1010 Wisconsin Avenue, Suite 800, Washington,
D. C. 20007 (Tel. (202) 337-9400)

H.B.M. INC.

HARRY E. LOCKERY, President, 139 Newbury Street, Framingham, Massachusetts 01701
(Tel. (617) 875-8282)

HOBART CORPORATION

EDWIN E. BOSHINSKI, Director, Dayton Research and Engineering, 1555 Stanley Avenue,
Dayton, Ohio 45404 (Tel. (513) 223-0452)

HOBART CORPORATION

FRED H. KATTERHEINRICH, Manager, Weights and Measures, Troy, Ohio 45374 (Tel. (513)
278-9496)

HOWE RICHARDSON SCALE COMPANY

JOHN W. AQUADRO, Vice President, Planning, 680 Van Houten Avenue, Clifton, New Jersey
07015 (Tel. (201) 471-3400)

HUNT WESSON FOODS, INC.

CHIP KLOOS, Section Head, Research and Development, 1645 West Valencia, Fullerton,
California 92634 (Tel. (714) 871-2100 Ext. 1098)

INSTITUTE FOR WEIGHTS AND MEASURES

MARY ANTHONY WEAVER, Program Director, Franklin University, 201 S. Grant Avenue,
Columbus, Ohio 43215 (Tel. (614) 438-4548)

INTERNATIONAL WEIGHING SYSTEMS

ALVIN WILKERSON, Vice President, 4213 S. 36 Place, Phoenix, Arizona 85040 (Tel.
(602) 258-5272)

THE KROGER COMPANY

DAVID P. LEAHY, Technical Consultant, 1240 State Avenue, Cincinnati, Ohio 45204
(Tel. (513) 244-3829)

LIQUID CONTROLS CORPORATION

WILLIAM C. REITZ, Product Manager, P. O. Box 101, North Chicago, Illinois 60064
(Tel. (312) 689-2400)

LITTON DATA SYSTEMS

GLENN E. RASMUSSEN, Manager of Metrology, 8000 Woodley Avenue, Van Nuys, California
91409 (Tel. (213) 781-8211 Ext. 4161)

LODEC, INC.

ROBERT B. HOOD, Director of Engineering, P. O. Drawer D, Lynwood, Washington 98036
(Tel. (206) 775-6471)

MEASUREGRAPH COMPANY

ERIC ALLEN, Technical Service Engineer, 4245 Forest Park Boulevard, St. Louis, Missouri
63108 (Tel. (314) 533-7800 Ext. 221)

MEASUREMENT SYSTEMS INTERNATIONAL

DAVID C. ENGLISH, President, 580 South Lucile Street, Seattle, Washington 98108
(Tel. (206) 767-7433)

METTLER INSTRUMENT CORPORATION

WALTER E. KUPPER, Manager, Research and Development, Box 71, Hightstown, New Jersey
08520 (Tel. (609) 448-3000)

M.F.A. INC.

WILLIAM M. BAKER, Director of Weights and Measures, 3501 Berrywood Drive, Columbia,
Missouri 65201 (Tel. (314) 874-5436)

MICHIGAN PEAT COMPANY

GARY WYSE, Distribution Manager, 2243 Milford Street, Houston, Texas 77098 (Tel.
(713) 522-0711)

MIDWEST RESEARCH INSTITUTE

RON EGNEW, Metrologist, 625 Volker Boulevard, Kansas City, Missouri 64110
(Tel. (816) 753-7600)

MILK AND ICE CREAM ASSOCIATIONS

AUSTIN T. RHOADS, Administrative Assistant, 910 17th Street, N. W., Washington
D. C. 20006 (Tel. (202) 296-4250)

MILLERS NATIONAL FEDERATION

LUCIEN D. AGNIEL, JR., Director of Technical Activities, 600 Maryland Avenue, S. W.,
Suite 305, Washington, D. C. 20036 (Tel. (202) 484-2200)

MISSOURI PACIFIC RAILROAD COMPANY

BILL STAPP, Scale Inspector, 6400 Martin Street, Kansas City, Missouri 64120
(Tel. (816) 245-2621)

MOBIL OIL CORPORATION

JOSEPH A. PETRELLI, Manager Operations Engineering, 3225 Gallows Road, Fairfax,
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